Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Front HVAC AUTO Control Circuit High (Switch located on Display Module)	B2A36	This diagnostic detects a voltage out of range high failure of the Front Faceplate Auto switch. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Auto Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >=2.8V	= OUT OF RANGE HIGH	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223C, U13FA	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Front HVAC AUTO Control Circuit Low (Switch located on Display Module)	B2A37	This diagnostic detects a voltage out of range low failure of the Front Faceplate Auto switch. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Rear Defog Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is <=0.6V	= OUT OF RANGE LOW	Diagnostic is enabled Front Faceplate Request Auto Setting Raw Sensed State is not The integrity of the CAN communication is good No DTCs:	= CbTRUE = OUT OF RANGE HIGH U223C, U13FA	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate HVACAUTO Control Circuit	B2A38	This diagnostic detects a failure of the Front Faceplate Auto switch in an invalid in-range state. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Auto Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >1.5V and <2.2V	= INDETERMINATE	Diagnostic is enabled Front Faceplate Auto Switch Sensed State is not Front Faceplate Auto Switch Sensead State is not The integrity of the CAN communication is good No DTCs:	= CbTRUE = OUT OF RANGE HIGH = OUT OF RANGE LOW B2A36, B2A37, U223C, U13FA	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Front HVAC AUTO Control Performance (Switch located on Display Module)	B2A39	This diagnostic detects a failure of the Front Faceplate Auto switch in a continuously applied state. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Auto Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >2.2V and <2.8V	= PRESSED	Diagnostic is enabled Front Faceplate Rear Defog Switch Sensed State is not Front Faceplate Rear Defog Switch Sensed State is not Front Faceplate Rear Defog Switch Sensed State is not The integrity of the CAN communication is good No DTCs:	= OUT OF RANGE HIGH = OUT OF RANGE LOW = INDETERMINATE B2A36, B2A37, B2A38, U223C, U13FA	Conditions are met for a continuous time >90.00 sec, followed by an additional 8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Blower Continuous Control Front (1) Circuit High (Switch located on Display Module)	B2A3E	This diagnostic detects a voltage out of range high failure of the Front Faceplate Blower Continuous Toggle. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Blower Level Front Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >=2.80V	= OUT OF RANGE HIGH	Diagnostic is enabled The integrity of the CAN communication is good No DTCs: Virtual Cockpit Unit Switchbank Communication Diagnostic Fault Pending	 U223C, U13FA = FALSE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Blower Continuous Control Front (1) Circuit Low (Switch located on Display Module)	B2A3F	This diagnostic detects a voltage out of range low failure of the Front Faceplate Blower Continuous Toggle. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Blower Level Front Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is <=0.60V	= OUT OF RANGE LOW	Diagnostic is enabled The integrity of the CAN communication is good No DTCs: Virtual Cockpit Unit Switchbank Communication Diagnostic Fault Pending Front Face Plate Request Blower Level Front Raw Sensed State (1) is NOT	 U223C, U13FA = FALSE = OUT OF RANGE HIGH	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate HVAC Blower Continuous Control Front (1) Circuit (Switch located on Display Module)	B2A40	This diagnostic detects a failure of the Front Faceplate Blower Continuous Toggle in an invalid in-range state. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Blower Continuous Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >1.30V and <2.70V	= INDETERMINATE	Diagnostic is enabled Front Faceplate Blower Continuous Switch Sensed State is not Front Faceplate Blower Continuous Switch Sensed State is not The integrity of the CAN communication is good No DTCs: VCS Switchbank Message Communication Fault Pending	 = OUT OF RANGE HIGH = OUT OF RANGE LOW B2A42, B2A43, U223C, U13FA = FALSE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Blower Continuous Control Front (1) Performance (Switch located on Display Module)	B2A41	This diagnostic detects a failure of the Front Faceplate Blower Continuous Toggle in a continuously applied state. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Blower Continuous Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >1.30V and <2.70V	= PRESSED	Diagnostic is enabled Front Faceplate Rear Defog Blower Continuous Switch Sensed State is not Front Faceplate Rear Defog Blower Continuous Switch Sensed State is not Front Faceplate Rear Defog Blower Continuous Switch Sensed State is not The integrity of the CAN communication is good No DTCs: Virtual Cockpit Unit Switchbank Communication Diagnostic Fault Pending Local FFP Blower Continuous Control Front Circuit (1) High Diagnostic Fault Pending Local FFP Blower Continuous Control Circuit (1) Low Diagnostic Fault Pending	 = OUT OF RANGE HIGH = OUT OF RANGE LOW = INDETERMINATE B2A3E, B2A3F, B2A40, U223C, U13FA = FALSE = FALSE = FALSE	Conditions are met for a continuous time >90.00 sec, followed by an additional 8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Local FFP Blower Continuous Control Circuit (1) Indeterminate Diagnostic Fault Pending	= FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Blower Continuous Control Front (2) Circuit High (Switch located on Display Module)	B2A42	This diagnostic detects a voltage out of range high failure of the Front Faceplate Blower Continuous Toggle. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Blower Level Front Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >=2.80V	= OUT OF RANGE HIGH	Diagnostic is enabled The integrity of the CAN communication is good No DTCs: Virtual Cockpit Unit Switchbank Communication Diagnostic Fault Pending	 U223C, U13FA = FALSE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Blower Continuous Control Front (2) Circuit Low (Switch located on Display Module)	B2A43	This diagnostic detects a voltage out of range low failure of the Front Faceplate Blower Continuous Toggle. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Blower Level Front Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is <=0.60V	= OUT OF RANGE LOW	Diagnostic is enabled The integrity of the CAN communication is good No DTCs: Virtual Cockpit Unit Switchbank Communication Diagnostic Fault Pending Front Face Plate Request Blower Level Front Raw Sensed State (1) is NOT	 U223C, U13FA = FALSE = OUT OF RANGE HIGH	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate HVAC Blower Continuous Control Front (2) Circuit Diagnostic (Switch located on Display Module)	B2A44	This diagnostic detects a failure of the Front Faceplate Blower Continuous Toggle in an invalid in-range state. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Blower Continuous Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >1.30V and <2.70V	= INDETERMINATE	Diagnostic is enabled Front Faceplate Blower Continuous Switch Sensed State is not Front Faceplate Blower Continuous Switch Sensed State is not The integrity of the CAN communication is good No DTCs: VCS Switchbank Message Communication Fault Pending	 = OUT OF RANGE HIGH = OUT OF RANGE LOW B2A42, B2A43, U223C, U13FA = FALSE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Blower Continuous Control Front (2) Performance (Switch located on Display Module)	B2A45	This diagnostic detects a failure of the Front Faceplate Blower Continuous Toggle in a continuously applied state. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Blower Continuous Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >1.30V and <2.70V	= PRESSED	Diagnostic is enabled Front Faceplate Rear Defog Blower Continuous Switch Sensed State is not Front Faceplate Rear Defog Blower Continuous Switch Sensed State is not Front Faceplate Rear Defog Blower Continuous Switch Sensed State is not The integrity of the CAN communication is good No DTCs: Virtual Cockpit Unit Switchbank Communication Diagnostic Fault Pending Local FFP Blower Continuous Control Front Circuit (1) High Diagnostic Fault Pending Local FFP Blower Continuous Control Circuit	 = OUT OF RANGE HIGH = OUT OF RANGE LOW = INDETERMINATE B2A42, B2A43, B2A44, U223C.U13FA = FALSE = FALSE	Conditions are met for a continuous time >90.00 sec, followed by an additional 8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(1) Low Diagnostic Fault Pending Local FFP Blower Continuous Control Circuit (1) Indeterminate Diagnostic Fault Pending	= FALSE = FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Max Defrost Control Circuit High (Switch located on Display Module)	B2A67	This diagnostic detects a voltage out of range high failure of the Front Faceplate Max Defrost switch. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Max Defrost Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >=2.8V	= OUT OF RANGE HIGH	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223C, U13FA	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Max Defrost Control Circuit Low (Switch located on Display Module)	B2A68	This diagnostic detects a voltage out of range low failure of the Front Faceplate Max Defrost switch. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Max Defrost Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is <=0.6V	= OUT OF RANGE LOW	Diagnostic is enabled Front Faceplate Request Rear Defog Setting Raw Sensed State is not The integrity of the CAN communication is good No DTCs:	= OUT OF RANGE HIGH U223C, U13FA	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate HVAC Max Defrost Control Circuit	B2A69	This diagnostic detects a failure of the Front Faceplate Max Defrost switch in an invalid in-range state. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Rear Defog Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >1.30V and <2.70V	= INDETERMINATE	Diagnostic is enabled Front Faceplate Max Defrost Switch Sensed State is not Front Faceplate Max Defrost Switch Sensed State is not The integrity of the CAN communication is good No DTCs:	=OUT OF RANGE HIGH = OUT OF RANGE LOW B2A67, B2A68, U0164, U0424	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Max Defrost Control Performance (Switch located on Display Module)	B2A6A	This diagnostic detects a failure of the Front Faceplate Max Defrost switch in a continuously applied state. The sensor voltage is measured by the smart device and is communicated to the diagnosing controller over CAN.	Front Faceplate Max Defrost Switch Sensed State (as evaluated by the Fully Integrated Display Module smart device) Note: The FIDM will set this condition when the measured voltage is >2.2V and <2.8V	**= PRESSED**	Diagnostic is enabled Front Faceplate Max Defrost Switch Sensed State is not Front Faceplate Max Defrost Switch Sensed State is not Front Faceplate Max Defrost Switch Sensed State is not The integrity of the CAN communication is good No DTCs:	 = OUT OF RANGE HIGH = OUT OF RANGE LOW = INDETERMINATE B2A67, B2A68, B2A69, U0164, U0424	Conditions are met for a continuous time > 90.00 sec, followed by an additional 8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Power Front Control Circuit High	B2A6B	This diagnostic detects a voltage out of range high failure of the Front Faceplate Power Switch. The sensor is hardwired to the diagnosing controller, which its voltage is being measured at.	Front Faceplate Request Front HVAC Power Switch Voltage	> 4.30 V	Diagnostic is enabled Controller has been awaken for a duration greater than (i.e. "Wakeup Pass" is True)	 >25.00 seconds	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Power Front Control Circuit Low	B2A6C	This diagnostic detects a voltage out of range low failure of the Front Faceplate Power Switch. The sensor is hardwired to the diagnosing controller, which its voltage is being measured at.	Front Faceplate Request Front HVAC Power Voltage	<1.40V	Diagnostic is enabled Controller has been awaken for a duration greater than (i.e. "Wakeup Pass" is True)	 >25.00 seconds	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Power Front Control Performance	B2A6E	This diagnostic detects a failure of the Front Faceplate Power Switch in a continuously applied state. The sensor is hardwired to the diagnosing controller, which its voltage is being measured at.	Front Faceplate Power Switch Voltage Front Faceplate Power Switch Voltage	>= 1.30 V <= 2.70 V	Diagnostic is enabled No Active Circuit DTC's Controller has been awaken for a duration greater than (i.e. "Wakeup Pass" is True)	B2A6B, B2A6C >25.00 seconds	Conditions are met for a continuous time >90.00 sec, followed by an additional 8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 1 Left Circuit High (Switch located on Display Module)	B2A87	This diagnostic detects a voltage out of range high failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	>2.80 V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 1 Left Circuit Low (Switch located on Display Module)	B2A88	This diagnostic detects a voltage out of range low failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	< 0.6 V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 1 Left Circuit (Switch located on Display Module)	B2A89	This diagnostic detects an invalid in-range voltage failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	>1.5V and <2.2V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 1 Left Performance (Switch located on Display Module)	B2A8A	This diagnostic detects a failure when the Front Faceplate Temperature Control Continuous Knob encoder waveform is irrational (one or more phases are stuck or in the wrong sequence). The correlation status of the encoder waveforms is detected by the smart device and is communicated to the diagnosing controller over CAN. The pass or fail status of this correlation status flag is stored in a 16-element array which updates in a first-in-first-out method with each new frame received by the diagnosing controller. The diagnostic will fail when sufficient array elements indicate a failure is present, acting like a moving window.	Front Faceplate Temperature Control Front Left Correlation Status (as evaluated by the Fully Integrated Display Module smart device)	= FAIL	Diagnostic is enabled Virtual Cockpit System LVDS Communication Fault Pending The integrity of the CAN communication is good No Active Circuit DTC	= FALSE B2A87, B2A8B, B2A8F, B2A88, B2A89, B2A8D, B2A91,B2A8C, B2A90, U223A, U13FA	A fault will mature when 5 out of the past 16 frames (1.0 sec periodic frame rate) have been received by the diagnosing controller with Correlation Status indicating that a failure is present.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 2 Left Circuit High (Switch located on Display Module)	B2A8B	This diagnostic detects a voltage out of range high failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	>2.8 V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 2 Left Circuit Low (Switch located on Display Module)	B2A8C	This diagnostic detects a voltage out of range low failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	< 0.6 V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 2 Left Circuit (Switch located on Display Module)	B2A8D	This diagnostic detects an invalid in-range voltage failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	>1.5V and <2.2V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 1 Right Circuit High (Switch located on Display Module)	B2A93	This diagnostic detects a voltage out of range high failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	>2.8 V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 1 Right Circuit Low (Switch located on Display Module)	B2A94	This diagnostic detects a voltage out of range low failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	< 0.6 V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 1 Right Circuit (Switch located on Display Module)	B2A95	This diagnostic detects an invalid in-range voltage failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	>1.5V and <2.2V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 1 Right Performance (Switch located on Display Module)	B2A96	This diagnostic detects a failure when the Front Faceplate Temperature Control Continuous Knob encoder waveform is irrational (one or more phases are stuck or in the wrong sequence). The correlation status of the encoder waveforms is detected by the smart device and is communicated to the diagnosing controller over CAN. The pass or fail status of this correlation status flag is stored in a 16-element array which updates in a first-in-first-out method with each new frame received by the diagnosing controller. The diagnostic will fail when sufficient array elements indicate a failure is present, acting like a moving window.	Front Faceplate Temperature Control Front Right Correlation Status (as evaluated by the Fully Integrated Display Module smart device)	= FAIL	Diagnostic is enabled Virtual Cockpit System Communication Fault Pending The integrity of the CAN communication is good No Active Circuit DTC	= FALSE B2A93, B2A97, B2A9B, B2A94, B2A98, B2A9C, B2A95, B2A99, B2A9D, U223A, U13FA	A fault will mature when 5 out of the past 16 frames (1.0 sec periodic frame rate) have been received by the diagnosing controller with Correlation Status indicating that a failure is present.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 2 Right Circuit High (Switch located on Display Module)	B2A97	This diagnostic detects a voltage out of range high failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	>2.8 V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 2 Right Circuit Low (Switch located on Display Module)	B2A98	This diagnostic detects a voltage out of range low failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	< 0.6 V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Faceplate Temperature Control Front 2 Right Circuit (Switch located on Display Module)	B2A99	This diagnostic detects an invalid in-range voltage failure of the Front Faceplate Temperature Control Continuous Knob circuit. The sensor voltage is measured by the smart device. The bucketed instantaneous circuit fault data is transmitted by the smart device to the diagnosing controller using an accumulator containing the total number of circuit fault evaluations (Total Evaluations) and an accumulator containing the total number of circuit fault evaluations that yielded a failing result (Failed Evaluations). The diagnosing controller uses the difference between current and previous values of Total Evaluations and Faulted Evaluations to mature the diagnostic.	Front Faceplate Temperature Control Front Continuous Knob voltage (as evaluated by the Fully Integrated Display Module smart device)	>1.5V and <2.2V	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	800 seconds out of a 1000 seconds window	Type B, 2 Trips
			The difference between current and previous values of Total Evaluations accumulator is OR The difference between current and previous values of Failed Evaluations accumulator is greater than the difference between current and previous values of Total Evaluations accumulator	= 0 counts	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U223A, U13FA	10.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Circuit High	B2B00	This diagnostic detects a short to battery fault on the blower motor output control circuit by monitoring circuit voltage while the blower is commanded on. When the diagnosing controller's board support package detects the fault it will communicate this through a fault status flag. When this fault is detected for 0.3 seconds, the board support package will command off the control output for 10 seconds before restarting.	Front blower power short fault status (as determined by the controller's board support package)	= Fail	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Front blower power short fault status (as determined by the controller's board support package) Front blower commanded duty cycle	 > 25.00 seconds # Indeterminate >0 %	0.15 seconds out of a 0.2 seconds window Note: This time is intended to mature the fault before the board support package shuts off the output control (protection mode) for 10 seconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Circuit Low	B2B01	This diagnostic detects a short to ground or open circuit fault on the blower motor output control circuit by monitoring circuit voltage while the blower is commanded off. When the diagnosing controller's board support package detects the fault it will communicate this through a fault status flag.	Front blower ground short fault status (as determined by the controller's board support package) OR Front blower open short fault status (as determined by the controller's board support package)	= Fail = Fail	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Front blower ground short fault status Front blower open fault status Front blower commanded duty cycle	> 25.00 seconds # Indeterminate # Indeterminate = 0 %	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Return Circuit High	B2B02	This diagnostic detects a short to battery fault on the blower motor speed feedback circuit by monitoring circuit duty cycle while the blower is commanded on.	Front Blower Feedback Duty Cycle AND Front Blower Feedback Duty Cycle	>= 0.00 % <=10.00%	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Front blower commanded duty cycle Commanded Front Blower Speed Duty Cycle has been greater than 10.00 % for a duration greater than	 > 25.00 seconds > 10.00% > 5.00 seconds	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Return Circuit Low	B2B03	This diagnostic detects a short to ground and open circuit fault on the blower motor speed feedback circuit by monitoring circuit duty cycle while the blower is commanded on.	Front Blower Feedback Duty Cycle AND Front Blower Feedback Duty Cycle	<=100.00% >= 90.00 %	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Front blower commanded duty cycle	 > 25.00 seconds > 10.00%	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Left Front Temp Actuator Performance Diagnostic	B2B05	This DTC will detect when the Temp Door travels to its commanded position within the full dynamic range and fails to reach the end of the commanded position short of a calibrated tolerance. This DTC is enabled when the enable criteria of this diagnostics is met and it is an X of Y diagnostic. This is a continuous diagnostic and runs during normal operation of vehicle. This DTC runs when the actuator door is commanded to move to a desired position, the request of which comes from customer through HVAC Actuator Controls algorithm.	**Failure Case 1:** All of the conditions are met: Front Left Temp Actuator LIN Actuator Retry Number Front Left Temp Actuator Actual Position Front Left Temp Actuator Performance Diagnostic Allowable Stalled Movement Range Front Left Temp Actuator Performance Diagnostic Stall Detected	>= 3 counts # Front Left Temp Actuator Future Position Desired # Normal = End Stop Detected	Diagnostic is Enabled Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure case 1 or case 2 or case 3 b) All of the following are met: i) Front Left Temp Actuator Performance Diagnostic Allowable Stalled Movement Range "ii) Front Left Temp Actuator Actual position "iii) Front Left Temp Actuator Actual position iV) Front Left Temp Actuator Learn Retry Count (counter has not	U0659, U140F =TRUE =Normal > (Front Left Temp Actuator Performance Diagnostic Future Position Desired -6,000 steps) < (Front Left Temp Actuator Performance Diagnostic Future Position Desired +6,000 steps) <3 counts	Upto 4.80 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					expired) v) Front Left Temp Actuator Expired Retry Timer vi) Front Left Temp Actuator LIN Actuator Retry Number	 <3 counts <3 counts		
			Failure Case 2: **All of the conditions are met:** Front Left Temp Actuator Performance Diagnostic Stall Detected Any of the conditions below are satisfied: Front Left Temp Actuator Learn Retry Count Front Left Temp Actuator Retry Timer count	 = End Stop Detected > 3 counts < 3 counts	Diagnostic is Enabled Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure case 1 or case 2 or case 3 b) All of the following are met: i) Front Left Temp Actuator Performance Diagnostic Allowable Stalled Movement Range is equal to Normal "ii) Front Left Temp Actuator Actual position	 U0659, U140F =TRUE =Normal > (Front Left Temp Actuator Performance Diagnostic Future Position Desired - 6,000 steps)	Up to 4.80 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					"iii) Front Left Temp Actuator Actual position	< (Left Front Temp Actuator Performance Diagnostic Future Position Desired + 6,000 steps)		
					iV) Front Left Temp Actuator Learn Retry Count (counter has not expired)	<3 counts		
					v) Front Left Temp Actuator Expired Retry Timer	< 3 counts		
					vi) Front Left Temp Actuator LIN Actuator Retry Number	< 3 counts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Right Front Temp Actuator Performance Diagnostic	B2B06	This DTC will detect when the Temp Door travels to its commanded position within the full dynamic range and fails to reach the end of the commanded position short of a calibrated tolerance. This DTC is enabled when the enable criteria of this diagnostics is met and it is a n X o f Y diagnostic. This is a continuous diagnostic and runs during normal operation of vehicle. This DTC runs when the actuator door is commanded to move to a desired position, the request of which comes from customer through HVAC Actuator Controls algorithm.	**Failure Case 1:** All of the conditions are met: Front Right Temp Actuator LIN Actuator Retry Number Front Right Temp Actuator Actual Position Front Right Temp Actuator Performance Diagnostic Allowable Stalled Movement Range Front Right Temp Actuator Performance Diagnostic Stall Detected	>= 3 counts # Front Right Temp Actuator Future Position Desired # Normal = End Stop Detected	Diagnostic is Enabled Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure case 1 or case 2 or case 3 b) All of the following are met: i) Front Right Temp Actuator Performance Diagnostic Allowable Stalled Movement Range is equal to Normal "ii) Front Right Temp Actuator Actual position "iii) Front Right Temp Actuator Actual position iV) Front Right Temp Actuator Learn Retry Count (counter has not expired)	U065A, U1410 =TRUE =Normal > (Front Right Temp Actuator Performance Diagnostic Future Position Desired -6,000 steps) < (Front Right Temp Actuator Performance Diagnostic Future Position Desired +6,000 steps) <3 counts	Up to 4.80 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					v) Front Right Temp Actuator Expired Retry Timer vi) Front Right Temp Actuator LIN Actuator Retry Number	< 3 counts < 3 counts		
			Failure Case 2: All of the conditions are met: Front Right Temp Actuator Performance Diagnostic Stall Detected Any of the conditions below are satisfied: Front Right Temp Actuator Learn Retry Count Front Right Temp Actuator Retry Timer count	= End Stop Detected > 3 counts < 3 counts	Diagnostic is Enabled Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure case 1 or case 2 or case 3 b) All of the following are met: i) Front Right Temp Actuator Performance Diagnostic Allowable Stalled Movement Range "ii) Front Right Temp Actuator Actual position	U065A, U1410 =TRUE =Normal > (Front Right Temp Actuator Performance Diagnostic Future Position Desired -6,000 steps)	Up to 4.80 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					"iii) Front Right Temp Actuator Actual position	< (Front Right Temp Actuator Performance Diagnostic Future Position Desired +6,000 steps)		
					iV) Front Right Temp Actuator Learn Retry Count (counter has not expired)	< 3 counts		
					v) Front Right Temp Actuator Expired Retry Timer	< 3 counts		
					vi) Front Right Temp Actuator LIN Actuator Retry Number	< 3 counts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Return Feedback Circuit Out of Range High	B2B0B	This diagnostic detects an implausibly high measured blower motor feedback speed by monitoring circuit frequency while the blower is commanded on.	Front Blower Feedback Frequency	>220.00 Hz	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Front blower commanded duty cycle No DTCs:	 > 25.00 seconds >10.00% B2B02, B2B03	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Return Feedback Circuit Out of Range Low	B2B0C	This diagnostic detects an implausibly low measured blower motor feedback speed by monitoring circuit frequency while the blower is commanded on.	Front Blower Feedback Frequency	<45.00 Hz	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Front blower commanded duty cycle Commanded Front Blower Speed Duty Cycle has been greater than 10.00 % for a duration greater than No DTCs:	 > 25.00 seconds >10.00% > 5.00 seconds B2B02, B2B03	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Left Front Temp Actuator Out of Range High Diagnostic	B2B28	This DTC will detect when the Temp Door actuator travels its full dynamic range and will fail if a Stall Detected signal from the LIN smart actuator is not received before a calibrated timer has expired or exceeds expected full dynamic range plus calibrated tolerance. This DTC is enabled when the enable criteria of this diagnostics is met and it is a n X o f Y diagnostic. This DTC runs during actuator Learn initiated by HVAC actuator Controls algorithm. The actuator Learn is a process where the actuator is commanded to perform its full dynamic range check. Actuator Learn primarily occurs during OFF Power Mode after a calibrated timer is expired.	**Fail Case 1:** The failure condition latch is set to True when all the following failure conditions are met for at least one execution: Front Left Temp Actuator Actual position Front Left Temp Actuator Actual position Front Left Temp Actuator Stop Movement Commanded Front Left Temp Actuator High End Stall Timer Front Left Temp Actuator Learn Retry Count Front Left Temp Actuator Expired Retry Timer Front Left Temp Actuator Suspend Learn The failure condition latch will be cleared all the following conditions are met for at least one execution: Failure conditions above are no longer met	< Front Left Temp Actuator Future Position Commanded > 12,995 steps = Stop > 0 seconds > 3 counts > 3 counts = True	Diagnostic is Enabled Front Left Temp Actuator Learn Active signal Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure is latched b) All of the following are met: i) Front Left Temp Actuator Stall Timer ii) Front Left Temp Actuator Stop Movement Commanded iii) Front Left Temp Actuator Actual position iv) Front Left Temp Actuator Actual Position	= TRUE U0659, U140F TRUE >0 seconds —Stop <= 12,995 steps >= 12,459 steps	Upto 4.80 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Front Left Temp Actuator Suspend Learn	= False				
			Fail Case 2: The failure condition latch is set to True when all the following failure conditions are met for at least one execution: Front Left Temp Actuator Low End Stall Timer Front Left Temp Actuator Stall Detected Front Left Temp Actuator Suspend Learn The failure condition latch will be cleared all the following conditions are met for at least one execution: Failure conditions above are no longer met Front Left Temp Actuator Suspend Learn	= 0 seconds = No End Stop Detected = True = False	Diagnostic is Enabled Front Left Temp Actuator Learn Active signal Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure is latched b) All of the following are met: i) Front Left Temp Actuator Stall Timer ii) Front Left Temp Actuator Stop Movement Commanded iii) Front Left Temp Actuator Actual	= TRUE U0659, U140F = TRUE >0 seconds —Stop	Up to 20.00 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					position iv) Front Left Temp Actuator Actual Position	<= 12,995 steps >= 12,459 steps		
			Fail Case 3: The failure condition latch is set to True when all the following failure conditions are met for at least one execution:AII of the conditions are met: Front Left Temp Actuator High End Stall Timer Front Left Temp Actuator Learn Retry Count Front Left Temp Actuator Expired Retry Timer Front Left Temp Actuator Stall Detected Front Left Temp Actuator Suspend Learn The failure condition latch will be cleared all the following conditions are met for at least one execution: Failure conditions above are no longer met	= 0 seconds > 3 counts > 3 counts = No End Stop Detected = True	Diagnostic is Enabled Front Left Temp Actuator Learn Active signal Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure is latched b) All of the following are met: i) Front Left Temp Actuator Stall Timer ii) Front Left Temp Actuator Stop Movement Commanded iii) Front Left Temp Actuator Actual position	= TRUE U0659, U140F =TRUE > 0 seconds —Stop <= 12,995 steps	Upto 120.00 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Front Left Temp Actuator Suspend Learn	= False	iv) Front Left Temp Actuator Actual Position	>= 12,459 steps		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Left Front Temp Actuator Out of Range Low Diagnostic	B2B29	This DTC will detect when the Temp Door is commanded to move to the higher end of its dynamic range and fails to reach the end of the commanded position short of a calibrated tolerance. This DTC is enabled when the enable criteria of this diagnostics is met and it is an X of Y diagnostic. This DTC runs during Actuator Learn initiated by HVAC Actuator Controls algorithm. The Actuator Learn is a process where the actuator is commanded to perform its full dynamic range check. Actuator Learn primarily occurs during OFF Power Mode after a calibrated timer is expired. After the actuator is commanded to the lower end of its dynamic range and the BCM has received End Stop Detected from the LIN smart actuator and the calibrated timer is not expired then the actuator is commanded to the high end of its dynamic range.	**Failure Case 1:** The failure condition latch is set to True when all the following failure conditions are met for at least one execution: Front Left Temp Actuator Actual position Front Left Temp Actuator Actual position Front Left Temp Actuator Stop Movement Commanded Front Left Temp Actuator High End Stall Timer Front Left Temp Actuator Learn Retry Count Front Left Temp Actuator Expired Retry Timer Front Left Temp Actuator Suspend Learn The failure condition latch will be cleared when all the following conditions are met for at least one execution: Failure conditions	< 12,459 steps < Front Left Temp Actuator Future Position Commanded = Stop > 0 seconds > 3 counts > 3 counts = True	Diagnostic is Enabled The diagnostic is enabled when all of the foilwing conditions are met: Front Left Temp Actuator Learn Active signal Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure is latched b) All of the following are met: i) Front Left Temp Actuator Stall Timer ii) Front Left Temp Actuator Stop Movement Commanded iii) Front Left Temp Actuator Actual	= TRUE U0659, U140F TRUE > 0 seconds —Stop <= 12,995 steps	Upto 4.80 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			above are no longer met. Front Left Temp Actuator Suspend Learn	 =False	position iv) Front Left Temp Actuator Actual Position	 >= 12,459 steps		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Right Front Temp Actuator Out of Range High Diagnostic	B2B2B	This DTC will detect when the Temp Door actuator travels its full dynamic range and will fail if a Stall Detected signal from the LIN smart actuator is not received before a calibrated timer has expired or exceeds expected full dynamic range plus calibrated tolerance. This DTC is enabled when the enable criteria of this diagnostics is met and it is an X of Y diagnostic. This DTC runs during actuator Learn initiated by HVAC actuator Controls algorithm. The actuator Learn is a process where the actuator is commanded to perform its full dynamic range check. Actuator Learn primarily occurs during OFF Power Mode after a calibrated timer is expired.	**Failure Case 1:** The failure condition latch is set to True when all the following failure conditions are met for at least one execution: Front Right Temp Actuator Actual position Front Right Temp Actuator Actual position Front Right Temp Actuator Stop Movement Commanded Front Right Temp Actuator High End Stall Timer Front Right Temp Actuator Learn Retry Count Front Right Temp Actuator Expired Retry Timer Front Right Temp Actuator Suspend Learn The failure condition latch will be cleared all the following conditions are met for at least one execution: Failure conditions above are no longer met	< Front Right Temp Actuator Future Position Commanded > 12,995 steps = Stop > 0 seconds > 3 counts > 3 counts = True	Diagnostic is Enabled Front Right Temp Actuator Learn Active signal Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure is latched b) All of the following are met: i) Front Right Temp Actuator Stall Timer ii) Front Right Temp Actuator Stop Movement Commanded iii) Front Right Temp Actuator Actual position iv) Front Right Temp Actuator Actual Position	= TRUE U065A, U1410 =TRUE > 0 seconds —Stop <= 12,995 steps >=12,459 steps	Upto 4.80 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Front Right Temp Actuator Suspend Learn	= False				
			Failure Case 2: The failure condition latch is set to True when all the following failure conditions are met for at least one execution:AII of the conditions are met: Front Right Temp Actuator Low End Stall Timer Front Right Temp Actuator Stall Detected Front Right Temp Actuator Suspend Learn The failure condition latch will be cleared all the following conditions are met for at least one execution: Failure conditions above are no longer met Front Right Temp Actuator Suspend Learn	= 0 seconds = No End Stop Detected = True = False	Diagnostic is Enabled Front Right Temp Actuator Learn Active signal Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure is latched b) All of the following are met: i) Front Right Temp Actuator Stall Timer ii) Front Right Temp Actuator Stop Movement Commanded iii) Front Right Temp Actuator Actual position iv) Front Right Temp Actuator Actual Position	= TRUE U065A, U1410 =TRUE > 0 seconds —Stop <= 12,995 steps >=12,459 steps	Up to 20.00 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	
			~~Failure Caso 3:~~		~~Diognootio~~io ~~Enabled~~		~~Up to 120.00~~	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			The failure condition latch is set to True when all the following failure conditions are met for at least one execution:AII of the conditions are met:AII of the conditions are met:		Front Right Temp Actuator Learn Active signal	= TRUE	Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	
					Integrity of the consumed LIN communication is good			
			Front Right Temp Actuator High End Stall Timer	= 0 seconds	No DTCs	U065A, U1410		
			Front Right Temp Actuator Learn Retry Count	> 3 counts	Only one of the following condition (a) or (b) is met:			
			Front Right Temp Actuator Expired Retry Timer	> 3 counts	a) Diagnostic failure is latched	=TRUE		
			Front Right Temp Actuator Stall Detected	= No End Stop Detected	b) All of the following are met:			
			Front Right Temp Actuator Suspend Learn	= True	i) Front Right Temp Actuator Stall Timer	> 0 seconds		
					ii) Front Right Temp Actuator Stop Movement Commanded	—Stop		
			The failure condition latch will be cleared all the following conditions are met for at least one execution:		iii) Front Right Temp Actuator Actual position	<= 12,995 steps		
			Failure conditions above are no longer met		iv) Front Right Temp Actuator Actual Position	>=12,459 steps		
			Front Right Temp Actuator Suspend Learn	= False				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Right Front Temp Actuator Out of Range Low Diagnostic	B2B2C	This DTC will detect when the Temp Door is commanded to move to the higher end of its dynamic range and fails to reach the end of the commanded position short of a calibrated tolerance. This DTC is enabled when the enable criteria of this diagnostics is met and it is a n X o f Y diagnostic. This DTC runs during Actuator Learn initiated by HVAC Actuator Controls algorithm. The Actuator Learn is a process where the actuator is commanded to perform its full dynamic range check. Actuator Learn primarily occurs during OFF Power Mode after a calibrated timer is expired. After the actuator is commanded to the lower end of its dynamic range and the BCM has received End Stop Detected from the LIN smart actuator and the calibrated timer is not expired then the actuator is commanded to the high end of its dynamic range.	**Failure Case 1:** The failure condition latch is set to True when all the following failure conditions are met for at least one execution:AII of the conditions are met: Front Right Temp Actuator Actual position Front Right Temp Actuator Actual position Front Right Temp Actuator Stop Movement Commanded Front Right Temp Actuator High End Stall Timer Front Right Temp Actuator Learn Retry Count Front Right Temp Actuator Expired Retry Timer Front Right Temp Actuator Suspend Learn The failure condition latch will be cleared when all the following conditions are met for at least one execution: Failure conditions above are no longer met.	= 12,459 steps < Front Right Temp Actuator Future Position Commanded = Stop > 0 seconds > 3 counts > 3 counts = TRUE	Diagnostic is Enabled The diagnostic is enabled when all of the foilwing conditions are met: Front Right Temp Actuator Learn Active signal Integrity of the consumed LIN communication is good No DTCs Only one of the following condition (a) or (b) is met: a) Diagnostic failure is latched b) All of the following are met: i) Front Right Temp Actuator Stall Timer ii) Front Right Temp Actuator Stop Movement Commanded iii) Front Right Temp Actuator Actual position	= TRUE U065A, U1410 =TRUE > 0 seconds —Stop <= 12,995 steps	Up to 4.80 Seconds (includes time for the actuator to perform the retries referenced in the fail criteria)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Front Right Temp Actuator Suspend Learn	=FALSE	iv) Front Right Temp Actuator Actual Position	>=12,459 steps		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Circuit Stuck On Diagnostic	B2BC2	This diagnostic detects a front blower speed feedback that is stuck to a high value when the blower is commanded off.	Front blower actual (feedback) speed is greater than	>= 50.0 rpm	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Battery Voltage In Range Status Front blower is commanded with a duty cycle less than The front blower duty cycle command has been 0% for a duration greater than	 > 25.00 seconds = True <10.00% >10.00 seconds	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Circuit Overspeed	B2BC3	This diagnostic detects a blower speed that is too low with respect to the expected speed based on the blower command. Measured actual blower speed is monitored against a calibrated lower acceptable limit under normal operating conditions.	Filtered difference between the commanded front blower speed and the actual (feedback) front blower speed is Note: the filter uses a first-order lag with time constant 1.00 (where 1.0 means no filtering, and 0.0 means max filtering).	< -1,062.0 rpm	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Battery Voltage In Range Status Front blower is commanded with a duty cycle greater than The front blower duty cycle command has been stable within 1.0% for a duration greater than HVAC System Mode has been in either Engine-On or Ignition-On state for a duration greater than: • OR outside air temperature is • OR front blower duty cycle command is No DTCs:	 > 25.00 seconds = True >10.00% > 10.00 seconds > 30.00 seconds <=30.00 °C <=50.00% B2B00, B2B01, B2B02, B2B03, B2B0B, B2B0C	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Blower Motor Speed Circuit Underspeed	B2BC4	This diagnostic detects a blower speed that is too high with respect to the expected speed based on the blower command. Measured actual blower speed is monitored against a calibrated upper acceptable limit under normal operating conditions.	Filtered difference between the commanded front blower speed and the actual (feedback) front blower speed is Note: the filter uses a first-order lag with time constant 1.00 (where 1.0 means no filtering, and 0.0 means max filtering).	> 1,062.0 rpm	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) Battery Voltage In Range Status Front blower is commanded with a duty cycle greater than The front blower duty cycle command has been stable within 1.0% for a duration greater than HVAC System Mode has been in either Engine-On or Ignition-On state for a duration greater than: • OR outside air temperature is • OR front blower duty cycle command is No DTCs:	 > 25.00 seconds = True >10.00% > 10.00 seconds > 30.00 seconds <=30.00 °C <=50.00% B2B00, B2B01, B2B02, B2B03, B2B0B, B2B0C	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Virtual Cockpit Unit Internal Electronic Failure	B2BCC	This diagnostic detects when Virtual Cockpit Unit (VCU) has internal electronic failure. The internal failure will be identified by VCU and is communicated to the diagnosing controller over CAN.	Virtual Cockpit Unit Internal Component Error The VCU will set this error flag to Fail when it detects internal controller related failures (e.g. RAM/ROM corruption) or graphics processing related failures.	= FAIL	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	 U164E, U0485	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fully Integrated Display Module Internal Electronic Failure	B2BCD	This diagnostic detects when Fully Integrated Display Module (FIDM) has internal electronic failure. The internal failures will be identified by the FIDM smart device and is communicated to the Virtual Cockpit Unit (VCU), which packages the failure indications into a single flag that is communicated to the diagnosing controller over CAN.	Fully Integrated Display Module Internal Electronic Failure is The FIDM will set this error flag when it detects internal display or controller related failures (e.g. OLDI/eDP, Display, Gate/Source Driver, Watchdog or MCU software reset, Abnormal power-on reset, Power Management, LVDS link lock), backlight related failures (e.g. backlight driver/LED fault), or touch panel related failures (e.g. touch element circuit faults).	= FAIL	Diagnostic is enabled The integrity of the CAN communication is good. The integrity of the private I2C communication between the FIDM and VCU is good. No DTCs:	U223B, U164E, U13F9, U0485	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Air Conditioning (A/C) Evaporator Temperature Sensor Circuit Low	P0537	This diagnostic detects a continuous short to ground on the Evaporator Air Temperature Sensor by monitoring sensor voltage (% of reference voltage) and failing when the voltage is too low.	Debouned Raw Evaporator Air Temperature Voltage is	< 0.17 (Volts)	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True)	= 25.00 sec	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Air Conditioning (A/C) Evaporator Temperature Sensor Circuit High	P0538	This diagnostic detects a continuous short to battery or open circuit on the Evaporator Air Temperature Sensor by monitoring sensor voltage (% of reference voltage) and failing when the voltage is too high.	Debouned Raw Evaporator Air Temperature Voltage is	> 4.75 (Volts)	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True)	 = 25.00 sec	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Air Conditioning (A/C) Evaporator Air Temperature Sensor Erratic	P0539	This diagnostic detects a intermittent short to ground or power, intermittent open circuit, or erratic signal on the Evaporator Air Temperature Sensor by monitoring sensor temperature and failing when the signal changes by a larger magnitude than expected across two measurements.	Evaporator Air Temperature changes across 2 consecutive samples by a magnitude (absolute value) greater than	> 4.00°C/sec	Diagnostic is Enabled 12 Volt System Voltage in Range Status Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) No Active DTCs	= TRUE = 25.00 sec P0538, P0537	8 seconds out of a 20 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Performance	P058A	The battery monitor module performance diagnostic is required to diagnose if the IBS sensor has any internal faults. The IBS checks a list of performance parameters as part of this diagnostic: reference voltage, voltage calibration check, current claibration check, NVM static data checksum, NVM dynamic data checksum, page 0 checksum, and wakeup timer check. Once all checks are completed in IBS the result is transmitted to BCM where appropriate DTC will be reported to DFIR. This diagnostic occurs once upon LIN wakeup, and the result is transmitted to BCM within 6 seconds.	IBS Sensor Internal Fault is TRUE (Internal IBS diagnostic)	= CeEM_e_IBS_DiagFailed	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Battery Monitor Module Performance Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100	6 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Current Monitoring Performance	P058B	The Battery Monitor Module Current Performance diagnostic is required to ensure there is not an open circuit fault at the shunt resistor. This diagnostic is performed within IBS and status is communicated to BCM where results are reported to DFIR. . IBS monitors the shunt resistor for open circuit while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 4 fails out of 5 samples at a rate of 16 second per sample.	IBS has open shunt condition, Battery Current Rationality Diagnostic Determination equals Diagnostic Failed (Internal IBS diagnostic)	= CeEM_e_IBS_DiagFailed	All of the following conditoins are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** IBS Current Performance Diagnostic Enable is **TRUE** IBS Current Performance Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Battery Current Rationality Historical Diagnostic Enable is **FALSE**	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B00 = U04B100 = FALSE	80 seconds (4 fails out of 5 samples at 16 seconds per sample)	Type B, 2 Trips
			IBS has open shunt condition: Battery Current Rationality Diagnostic Determination equals Diagnostic Failed	= CeEM_e_IBS_DiagFail	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			(Internal IBS diagnostic)	ed		hysteresis disable < 10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					IBS Current Performance Diagnostic Enable is **TRUE**	= CbTRUE		
					IBS Current Performance Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Temperature Monitoring Performance	P058C	The battery monitor module temperature monitoring performance is required to diagnose if the difference between IBS NTC raw temperature and IBS ASIC raw temperature is within a rational threshold. This diagnostic is performed in BCM by comparing the difference between NTC and ASIC temperature values sent by IBS with a calibratable threshold. IBS records upto 24 temperature samples at a rate of 1 set of sample per 30min while LIN is off. These 24 sets of samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Absolute difference between ASIC Raw Temperature and NTC Raw Temperature is above threshold	> 10.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Outside Air Temperature is within range IBS Temperature Performance Diagnostic Enable is **TRUE** IBS Temperature Performance Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC No Active IBS Temperature Out of Range DTCs	> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100 = P058E00, P058F00, P16DE00, P16DF00	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Absolute difference between ASIC Raw Temperature and NTC Raw Temperature is above threshold	> 10.00 degrees Celsius	All of the following conditions are met:		8 seconds out of a 10 seconds window	
					System 12V Battery Voltage is above threshold	> 11.00 volts (with hysteresis disable < 10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					Outside Air Temperature is within range	> -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					IBS Temperature Performance Diagnostic Enable is **TRUE**	= CbTRUE		
					IBS Temperature Performance Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	> 0 AMn		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No Active IBS Temperature Out of Range DTCs	<= 24 = P058E00, P058F00, P16DE00, P16DF00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Voltage Monitoring Performance	P058D	The Battery Monitor Module Voltage Performance diagnostic is required to diagnose if the IBS Battery Voltage Sensor is accurately sensing the 12V Battery Voltage. The IBS battery voltage high resolution will be transmitted via LIN message from the sensor indicating what its internal sensor is reading for voltage. This voltage is compared with BCM's internal voltage reading (12V System Voltage). If the difference between the two voltages is greater than a calibratable threshold, then the fail counter will increment. Due to the high fluctuation of voltage during cranking event, this diagnostic is disabled from beginning of crank to a calibratable time delay after the end of crank. This diagnostic uses an X of Y strategy.	Absolute difference between Battery Monitor Module Voltage and BCM System Voltage is above threshold	>5.00 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Battery Monitor Module Voltage Performance Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC No Active Battery Voltage Out of Range DTCs Powertrain Crank Active is **FALSE** Post-Crank Time Delay has elapsed	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100 = P16D400, P16D500 = FALSE >5,000.00 seconds	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Temperature High	P058E	The Battery Monitor Module Temperature Out of Range High diagnostic is required to diagnose if the IBS ASIC Raw Temperature is above selected threshold value. This diagnostic is performed in BCM by comparing raw ASIC temperature values sent by IBS with a calibratable threshold. IBS records up to 24 temperature samples at a rate of 1 sample per 30min while LIN is off. These 24 samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Battery Monitor Module ASIC Temperature above threshold	> 120.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Outside Air Temperature is within range IBS Temperature High Diagnostic Enable is **TRUE** IBS Temperature High Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100	4 seconds out of a 5 seconds window	Type B, 2 Trips
			Battery Monitor Module ASIC Temperature above threshold	> 120.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with hysteresis disable <	4 seconds out of a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					Outside Air Temperature is in range	> -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					IBS Temperature High Diagnostic Enable is **TRUE**	= CbTRUE		
					IBS Temperature High Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	> 0 AND <= 24		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Temperature Low	P058F	The Battery Monitor Module Temperature Out of Range Low diagnostic is required to diagnose if the IBS ASIC Raw Temperature is above selected threshold value. This diagnostic is performed in BCM by comparing raw ASIC temperature values sent by IBS with a calibratable threshold. IBS records up to 24 temperature samples at a rate of 1 sample per 30min while LIN is off. These 24 samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Battery Monitor Module ASIC Temperature below threshold	<-43.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Outside Air Temperature is within range IBS Temperature Low Diagnostic Enable is **TRUE** IBS Temperature Low Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100	4 seconds out of a 5 seconds window	Type B, 2 Trips
			Battery Monitor Module ASIC Temperature below threshold	<-43.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with hysteresis disable <	4 seconds out of a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					Outside Air Temperature is in range	> -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					IBS Temperature Low Diagnostic Enable is **TRUE**	= CbTRUE		
					IBS Temperature Low Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	> 0 AND <= 24		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Driver Mode Select Switch A Circuit Low	P05D1	This DTC will detect an OBD-compliant analog switch bank 1 input that is too low (out-of-range low).	Analog Mode Switch low voltage threshold	< 1.0029 V	VehicleSwitchBankl Diagnostic Enable calibration is **TRUE** VehicleSwitchBankl Circuit Diagnostic Enable calibration is **TRUE** VehicleSwitchBankl Circuit Out-Of-Range Low Diagnostic Enable calibration is **TRUE**	= CbTRUE = CbTRUE = CbTRUE	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Driver Mode Select Switch A Circuit High	P05D2	This DTC will detect an OBD-compliant analog switch bank 1 input that is too high (out-of-range high).	Analog Mode Switch high voltage threshold	> 4.7412 V	VehicleSwitchBankl Diagnostic Enable calibration is **TRUE** VehicleSwitchBankl Circuit Diagnostic Enable calibration is **TRUE** VehicleSwitchBankl Circuit Out-Of-Range High Diagnostic Enable calibration is **TRUE** If Smart VSB Present is **TRUE,** then foillowing conditions are included RunCrankRelay is TRUE for IGN ON Delay Time	= CbTRUE = CbTRUE = CbTRUE = CbFALSE = 100.00 (ms)	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Driver Mode Select Switch A Range/ Performance	P05D3	This DTC will detect an OBD-compliant analog switch bank 1 input that is invalid within its performance range (in-range deadband).	Analog Mode Switch indeterminate (deadband) regions for 8-state analog resistor ladder	1.0029 < sensed voltage < 1.1025 2.7393 < sensed voltage < 2.7959 3.8799 < sensed voltage < 3.9365 4.6406 < sensed voltage < 6.00 7.00 < sensed voltage < 6.00 7.00 < sensed voltage < 6.00 7.00 < sensed voltage < 6.00 7.00 < sensed voltage < 6.00 7.00 < sensed voltage < 4.74	VehicleSwitchBankl Diagnostic Enable calibration is TRUE VehicleSwitchBankl Circuit Diagnostic Enable calibration is TRUE VehicleSwitchBankl Circuit Performance Diagnostic Enable calibration is TRUE	= CbTRUE = CbTRUE = CbTRUE	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if the calibration check sum is incorrect or the flash memory detects an uncorrectable error via the Error Correcting Code.	The Primary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1 failure if the fault is detected during the first pass. 5 failures if the fault occurs after the first pass is complete.			Diagnostic runs continuously in the background.	Type B, 2 Trips
			The Primary Processor's Error Correcting Code hardware in the flash memory detects an error. Covers all software and calibrations.	254 failures detected via Error Correcting Code			Diagnostic runs continuously via the flash hardware.	
				In all cases, the failure count is cleared when controller shuts down				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Long Term Memory Reset	P0603	This DTC detects an invalid NVM which includes a Static NVM, Perserved NVM, ECC ROM in NVM Flash Region, and Perserved NVM during shut down.	Static NVM region error detected during initialization		Static NVM fault on default diagnostic enable is **CbTRUE** Allow blank BINVDM must be **CbFALSE**	= CbTRUE = CbFALSE	Diagnostic runs at controller power up.	Type B, 2 Trips
			Cumulative NVM region error detected during initialization		Cumulative NVM fault on default diagnostic enable is **CbTRUE** Allow blank BINVDM must be **CbFALSE**	= CbTRUE = CbFALSE	Diagnostic runs at controller power up.	
			SSAR NVM region error detected during initialization.		SSAR NVM fault on default diagnostic enable is **CbTRUE** Allow blank BINVDM must be **CbFALSE**	= CbTRUE = CbFALSE	Diagnostic runs at controller power up.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module RAM Failure	P0604	Indicates that the control module has detected a RAM fault. This includes read/ write failures such as a Primary Processor System RAM Fault, Primary Processor Cache RAM Fault, and Primary Processor eTPU RAM Fault. This diagnostic runs continuously.	Indicates that the primary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	Type B, 2 Trips
			Indicates that the primary processor is unable to correctly read data from or write data to cached RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor is unable to correctly read data from or write data to TPU RAM. Detects data read does not match data written >=	3 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Processor Integrity Fault	P0606	Indicates that the control module has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for the primary processor.	2 fails in a row in the MAIN processor's ALU check			Test is Enabled: CbTRUE (If CbFALSE, this test is disabled)	25 ms	Type B, 2 Trips
			2 fails in a row in the MAIN processor's configuration register masks versus known good data			Test is Enabled: CbTRUE (If 0, this test is disabled)	12.5 to 25 ms	
			Checks number of stack over/under flow since last powerup reset >=	5.00		Test is Enabled: CbTRUE (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			Test 1 Voltage Test 2 Voltage Test 3 Voltage Test 4 Voltage	> 0.09 V < -0.09 V > 1.97V < 1.79V > 3.22 V < 3.04 V > 5.09 V < 4.91V	Arbitrated Battery Voltage	Test is Enabled: CbTRUE (If 0, this test is disabled) > 7.00 V	16 / 20 counts or 822 milliseconds continuous; 50 ms/count in the ECM main processor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Processor Integrity Performance	P0607	Indicates that the control module has detected an internal processor integrity performance.	Safety critical software is not executed in proper order OR Monitor Task counter exceeds max count threshold (See Enable Conditions for which tasks rates are enabled) 2.5ms: 3.125ms: 5ms: 6.25ms: 10ms: 12.5ms: 20ms: 25ms:	 >=5 incorrect task counts OR > 60 max task count >=4 incorrect task counts OR > 48 max task count >=3 incorrect task counts OR > 30 max task count >=2 incorrect task counts OR > 24 max task count >=2 incorrect task counts OR > 15 max task count >=1 incorrect task counts OR > 12 max task count >=1 incorrect task counts OR > 9 max task count >=1 incorrect task counts OR		Test is Enabled: (If CbFALSE, this test is disabled) 2.5ms: CbFALSE 3.125ms: CbFALSE 5ms: CbTRUE 6.25ms: CbFALSE 10ms: CbTRUE 12.5ms: CbFALSE 20ms: CbFALSE 25ms: CbTRUE 40ms: CbFALSE 50ms: CbTRUE 80ms: CbFALSE 100ms: CbTRUE 250ms: CbFALSE	Counts: 2.5ms: 8/10 3.125ms: 8/10 5ms: 8/10 6.25ms: 8/10 10ms: 8/10 12.5ms: 8/10 20ms: 8/10 25ms: 8/10 40ms: 4/5 50ms: 4/5 80ms: 2/3 100ms: 2/3 250ms: 2/3 50 ms/count in the main processor	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				> 6 max task count				
			40ms:	>= 1 incorrect task counts OR > 9 max task count				
			50ms:	>= 1 incorrect task counts OR > 6 max task count				
			80ms:	>= 1 incorrect task counts OR > 12 max task count				
			100ms:	>= 2 incorrect task counts OR > 9 max task count				
			250ms:	>= 1 incorrect task counts OR > 6 max task count				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Internal Control Module EEPROM Error	P062F	This DTC detects a NVM long term performance. There are two types of diagnostics that run during controller power up. One for HWIO reports that writing to NVM (at shutdown) will not succeed, and the other HWIO reports the assembly calibration integrity check has failed.	HWIO reports that writing to NVM (at shutdown) will not succeed				Diagnostic runs at controller power up.	Type B, 2 Trips
			HWIO reports the assembly calibration integrity check has failed				Diagnostic runs at controller power up.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on the 5 volt reference circuit #3 by monitoring the reference percent Vref3 and failing the diagnostic when the percent Vref3 is too low or if the delta between the filtered percent Vref3 and non-filtered percent Vref3 is too large. This diagnostic only runs when battery voltage is high enough.	BCM percent Vref3 < or BCM percent Vref3 >> or the difference between BCM filtered percent Vref3 and percent Vref3 >	78.13% Vref3 89.49 % Vref3 7.0000 % Vref3	Diagnostic enabled	= CbTRUE	0.8 seconds out of a 1 seconds window or 200.00 sec continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Temperature Erratic	P100C	The Battery Monitor Module Temperature Erratic diagnostic is required to diagnose if the IBS ASIC Raw Temperature sensor is erratic, caused by sudden short to ground or short to high. This diagnostic is performed in BCM by adding the absolute raw ASIC temperature values sent by IBS over a period of time and comparing with a calibratable threshold. This diagnostic uses the X of Y strategy.	Sum of the absolute difference between 10.00 ASIC Raw Temperature samples is above threshold	> 70.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Outside Air Temperature is within range Temperature Erratic Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = U01B000 = U04B100	40 seconds out of a 50 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Internal Temperature Erratic	P100D	The Battery Monitor Module Internal Temperature Erratic diagnostic is required to diagnose if the IBS NTC Raw Temperature sensor is erratic, caused by sudden short to ground or short to high. This diagnostic is performed in BCM by adding the absolute raw NTC temperature values sent by IBS over a period of time and comparing with a calibratable threshold. This diagnostic uses the X of Y strategy.	Sum of the absolute difference between 10.00 NTC Raw Temperature samples is above threshold	> 70.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Outside Air Temperature is within range Temperature Circuit Erratic Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = U01B000 = U04B100	40 seconds out of a 50 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Air Conditioning (A/C) Evaporator Temperature Sensor Not Plausible - Sensor Rationality	P153B	This diagnostic detects non plausible evaporator temperature sensor by comparing the Evaporator Air Temperature with Inlet Air Temperature and Outside Air Temperature once per drive cycle after a long soak time and failing when the absolute difference is too high.	If the absolute value of the differences between Raw Evaporator Air Temperature and the Inlet Air Temperature Sensor Value is If the absolute value of the differences between Raw Evaporator Air Temperature and the Outside Air Temperature Sensor Value is	> 20.00 degC > 15.00 degC	Diagnostic is Enabled Controller has been awake for a duration greater than (i.e. "Wakeup Pass" is True) OBD Bias Check Enable Invalidity Indication of Propulsion System Off Time Propulsion System Off Time Don't Use Data Indication Invalidity Indications of Inlet Air Temperature Sensor Value Outside Air Temperature Sensor Diagnosti Bundle Fault Active Value of Propulsion System Off Timer is The integrity of the CAN communication is good No Active DTCs	= 25.00 sec = TRUE = VALID = FALSE = VALID = FALSE > 28,800.00 (Seconds) P0538, P0537, P0535, U1611	3.2 seconds out of a 4 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Circuit Voltage Low	P16D4	The Battery Monitor Module Circuit Low Voltage diagnostic is performed within intelligent battery sensor and is required to diagnose if the Sensor Voltage is out of range low. Once diagnostic determination is reached in IBS, the status is communicated to BCM where results are reported to DIFR. IBS monitors the battery voltage while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 200 fails out of 250 samples at a rate of 0.001 second per sample. The diagnostic result is sent to BCM continuously once per 0.25 seconds.	Battery Monitor Module Circuit Voltage below threshold (Internal IBS Diagnostic)	< 3 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Battery Voltage Out of Range Low Diagnostic Enable is **TRUE** Battery Voltage Out of Range Low Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Battery Voltage Out of Range Low Historical Diagnostic Enable is **FALSE**	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100 = FALSE	0.25 seconds (200 fails out of 250 samples at 0.001 second loop rate)	Type B, 2 Trips
			Battery Monitor Module Circuit Voltage below threshold (Internal IBS Diagnostic)	< 3 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						hysteresis disable < 10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					Battery Voltage Out of Range Low Diagnostic Enable is **TRUE**	= CbTRUE		
					Battery Voltage Out of Range Low Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Circuit Voltage High	P16D5	The Battery Monitor Module Circuit High Voltage diagnostic is performed within intelligent battery sensor and is required to diagnose if the Sensor Voltage is out of range high. Once diagnostics determination is reached in IBS, the status is communicated to BCM where results are reported to DIFR. IBS monitors the battery voltage while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 200 fails out of 250 samples at a rate of 0.001 second per sample. The diagnostic result is sent to BCM continuously once per 0.25 seconds.	Battery Monitor Module Circuit Voltage above threshold (Internal IBS Diagnostic)	> 26 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Battery Voltage Out of Range High Diagnostic Enable is **TRUE** Battery Voltage Out of Range High Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Battery Voltage Out of Range High Historical Diagnostic Enable is **FALSE**	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100 = FALSE	0.25 seconds (200 fails out of 250 samples at 0.001 second loop rate)	Type B, 2 Trips
			Battery Monitor Module Circuit Voltage above threshold (Internal IBS Diagnostic)	> 26 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						hysteresis disable < 10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					Battery Voltage Out of Range High Diagnostic Enable is **TRUE**	= CbTRUE		
					Battery Voltage Out of Range High Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Current Low	P16D6	The Battery Monitor Module Current Out of Range Low diagnostic is performed within intelligent battery sensor and is required to diagnose if the sensor current is out of range low. Once diagnostic determination is reached in IBS, the status is communicated to BCM where results are reported to DIFR. IBS monitors the battery current while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 200 fails out of 250 samples at a rate of 0.001 second per sample. The diagnostic result is sent to BCM continuously once per 0.25 seconds.	Battery Monitor Module Current below threshold (Internal IBS diagnostic)	< -1400 Amps	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** IBS Current Out of Range Low Diagnostic Enable is **TRUE** IBS Current Out of Range Low Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Shunt Voltage Out of Range Low Historical Diagnostic Enable is **FALSE**	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100 = FALSE	0.25 seconds (200 fails out of 250 samples at 0.001 second loop rate)	Type B, 2 Trips
			Battery Monitor Module Current below threshold (Internal IBS diagnostic)	< -1400 Amps	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						hysteresis disable < 10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					IBS Current Out of Range Low Diagnostic Enable is **TRUE**	= CbTRUE		
					IBS Current Out of Range Low Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Current High	P16DD	The Battery Monitor Module Current Out of Range High diagnostic is performed within intelligent battery sensor and is required to diagnose if the sensor current is out of range high. Once diagnostic determination is reached in IBS, the status is communicated to BCM where results are reported to DIFR. IBS monitors the battery current while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 200 fails out of 250 samples at a rate of 0.001 second per sample. The diagnostic result is sent to BCM continuously once per 0.25 seconds.	Battery Monitor Module Current above threshold (Internal IBS diagnostic)	> 1400 Amps	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** IBS Current Out of Range High Diagnostic Enable is **TRUE** IBS Current Out of Range High Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Shunt Voltage Out of Range High Historical Diagnostic Enable is **FALSE**	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100 = FALSE	0.25 seconds (200 fails out of 250 samples at 0.001 second loop rate)	Type B, 2 Trips
			Battery Monitor Module Current above threshold (Internal IBS diagnostic)	> 1400 Amps	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						hysteresis disable < 10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					IBS Current Out of Range High Diagnostic Enable is **TRUE**	= CbTRUE		
					IBS Current Out of Range High Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Internal Temperature Circuit Low	P16DE	The Battery Monitor Module Internal Temperature Out of Range High diagnostic is required to diagnose if the IBS NTC Raw Temperature is above selected threshold value. This diagnostic is performed in BCM by comparing raw NTC temperature values sent by IBS with a calibratable threshold. IBS records upto 24 temperature samples at a rate of 1 sample per 30min while LIN is off. These 24 samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Battery Monitor Module NTC Temperature above threshold	> 120.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Outside Air Temperature is within range Temperature Circuit Low Diagnostic Enable is **TRUE** Temperature Circuit Low Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100	4 seconds out of a 5 seconds window	Type B, 2 Trips
			Battery Monitor Module NTC Temperature above threshold	> 120.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	4 seconds out of a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						hysteresis disable < 10.00)		
					IBS NormalCommEnable is **TRUE**	= TRUE		
					Outside Air Temperature is in range	> -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					Temperature Circuit Low Diagnostic Enable is **TRUE**	= CbTRUE		
					Temperature Circuit Low Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	> 0 AND <= 24		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Internal Temperature Circuit High	P16DF	The Battery Monitor Module Internal Temperature Out of Range High diagnostic is required to diagnose if the IBS NTC Raw Temperature is above selected threshold value. This diagnostic is performed in BCM by comparing raw NTC temperature values sent by IBS with a calibratable threshold. IBS records upto 24 temperature samples at a rate of 1 sample per 30min while LIN is off. These 24 samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Battery Monitor Module NTC Temperature below threshold	<-43.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Outside Air Temperature is within range Temperature Circuit High Diagnostic Enable is **TRUE** Temperature Circuit High Continuous Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100	4 seconds out of a 5 seconds window	Type B, 2 Trips
			Battery Monitor Module NTC Temperature below threshold	<-43.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above		4 seconds out of a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					threshold	> 11.00 volts (with hysteresis disable < 10.00)		
					IBS NormalCommEnable is TRUE	= TRUE		
					Outside Air Temperature is within range	> -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					Temperature Circuit High Diagnostic Enable is **TRUE**	= CbTRUE		
					Temperature Circuit High Historical Diagnostic Enable is **TRUE**	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	> 0 AND <= 24		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Random Access Memory (RAM) Error	P16E1	The battery Monitor Module performance (RAM) error diagnostic is required to diagnose if the IBS sensor has any internal RAM faults. This diagnostic is performed within IBS and the status is transmitted to BCM where results are reported to DFIR. This diagnostic takes approximately 10 seconds to complete upon LIN wakeup, and is only run once per wakeup. The result is immediately transmitted to BCM after.	IBS Sensor Internal RAM Fault detected: IBS Internal Fault RAM Determination equals **DiagFailed** (internal IBS diagnostic)	= CeEM_e_IBS_DiagFailed	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS LIN Normal Communication Enable is **TRUE** Battery Monitor Module RAM Error Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100	10 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Random Access Memory (ROM) Error	P16E2	The battery Monitor Module performance (ROM) error diagnostic is required to diagnose if the IBS sensor has any internal ROM faults. This diagnostic is performed within IBS and the status is transmitted to BCM where results are reported to DFIR.This diagnostic takes approximately 60 seconds to complete upon LIN wakeup, and is only run once per wakeup. The result is immediately transmitted to BCM after.	IBS Sensor Internal ROM Fault detected: IBS Internal Fault RAM Determination equals **DiagFailed** (internal IBS diagnostic)	= CeEM_e_IBS_DiagFailed	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** Battery Monitor Module ROM Error Diagnostic Enable is **TRUE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100	60 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Data Incompatible Diagnostic	P16E3	The Battery Monitor Module Data Incompatible diagnostic is required to diagnose if the IBS is using the correct configuration information being transmitted by the Host controller to it. The IBS reads and transmits the configuration values it has loaded internally back to the host controller for verification. The historical test evaluates the IBS configuration return values to check if they are equal to the host controller's values. The diagnostic is executed once per host controller wakeup and checks only the first transmitted LIN message containing the IBS return configuration message. The continuous test compares the IBS configuration return values to those sent by BCM and uses X of Y maturation strategy to determine diagnostic state.	Any of the following criteria are met: IBS Config Return Battery Type is NOT equal to Vehicle Battery Type Configuration Battery Nominal Return C20 is above threshold IBS Config Return Battery Cal #1 U40% is above threshold IBS Config Return Battery Cal #2 U80% is above threshold IfSOC Bounding Limit Configuration check is **TRUE** then following conditions are included SOC Bounding Limit Hr3 Difference is above the threshold SOC Bounding Limit Hr8 Difference is above the threshold SOC Bounding Limit Hr24 Difference is above threshold	NOT equal to Vehicle Battery Type Configuration CeEPM_ADV_BATT_TECH-AGM >5.00 >0.50 >0.50 = CbTRUE >0.01 >0.01 >0.01	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is **TRUE** IBS Configuration Diagnostic Continuous Enable is **TRUE** Battery Monitor Module Data Incompatible Determination Historical Diagnostic Enable is **FALSE** No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = FALSE = U01B000 = U04B100	5 seconds out of a 6 seconds window	Type B, 2 Trips
			Any of the following criteria are met IBS Config Return		All of the following conditions are met: System 12V Battery Voltage is above		1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Battery Type is NOT equal to Vehicle Battery Type Configuration	NOT equal to Vehicle Battery Type Configuration CeEPM_ADV_BATT_ TECH_AGM	threshold	> 11.00 volts (with hysteresis disable < 10.00)		
			Battery Nominal Return C20 is above threshold	>5.00	IBS NormalCommEnable is TRUE	= TRUE		
			IBS Config Return Battery Cal #1 U40% is above threshold	>0.50	IBS Configuration Diagnostic Historical Enable is TRUE	= CbTRUE		
			IBS Config Return Battery Cal #2 U80% is above threshold	>0.50	No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
			IfSOC Bounding Limit Configuration check is TRUE then following conditions are included	= CbTRUE	No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
			SOC Bounding Limit Hr8 Difference is above the threshold	>0.01				
			SOC Bounding Limit Hr8 Difference is above the threshold	>0.01				
			SOC Bounding Limit Hr24 Difference is above threshold	>0.01				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Wake-Up Not Detected	P16FD	Detects when a control module did not wake-up at time scheduled by the wake-up alarm at shutdown.	Real Time Clock has exceeded expected wake-up time as defined by alarms scheduled at shutdown	>= 1 failure to meet scheduled controller wake-up	Control Module wake-up not detected Diagnostic Enable calibration is **CbTRUE**	= CbTRUE	Variable, dependent on scheduled controller wake-up times at shutdown	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Compartment Ajar Performance	P257D	The Engine Compartment Ajar Performance diagnostic is performed to diagnose if the input voltage falls in the deadband voltage range.	Hood Switch position is in an invalid(deadband) range.	59.34% <x< 66.96%	The diagnostic is enabled		1 seconds out of a 1.25 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Compartmen t Ajar Circuit Low	P257E	The Engine Compartment Ajar Circuit Low diagnostic is performed to diagnose if the input voltage is out of range low or short to ground.	Hood switch low voltage threshold Hood switch position reading is lower than expected bounds.	< 28.54%	The diagnostic is enabled		1 seconds out of a 1.25 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Compartment Ajar Circuit High	P257F	The Engine Compartment Ajar Circuit High Voltage diagnostic is performed to diagnose if the input voltage is out of range than the highest valid voltage or short to battery.	Hood Switch high voltage threshold Hood Switch position reading is higher than an expected bounds	> 85.2%	The diagnostic is enabled		1 seconds out of a 1.25 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Off Timer Performance	P262B	This DTC determines if the hardware timer does not initialize or count properly. There are two tests to ensure proper functioning of the timer: Count Up Test (CUT) and Range Test (RaTe). Count Up Test (CUT): Verifies that the HWIO timer is counting up with the proper increment. Range Test (RaTe): When the run/crank is not active both the hardware and mirror timers are started. The timers are compared when module shutdown is initiated or run/crank becomes active.	Count Up Test: Time difference between the current value and the previous value of the timer Range Test: The variation of the HWIO timer and mirror timer is	> 1.50 seconds > 0.25%.			Count Up Test: 4 failures out of 20 samples 1 sec / sample Continuous while run/crank is not active and until controller sleep occurs Range Test: Once or twice per trip, performed when controller shutdown is initiated or run/ crank becomes active	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Security Peripheral Performance	P3186	This DTC indicates the security peripheral has experienced an internal fault indicating that MAC verification results are unreliable.	MAC verification has falsely passed a configurable number of times.	3.00	Calibration enable	= CbTRUE Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication CAN 9 Off	U0078	This DTC monitors for a CAN 9 bus off condition	Bus off failures equals or exceeds	>= 10.00 counts in a sliding window of 50 samples	General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for CAN channel is requesting full communications Normal CAN transmission on Bus is enabled Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or	>=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts CbFALSE (CbTRUE indicates enabled)	Diagnostic runs in 10 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Battery Monitor Module	U01B0	This DTC monitors for a loss of communication with the Battery Monitor Module on the LIN bus.	Message is not received from device for IBSAmpHrChrg_Rsp_PDU IBSAmpHrDisChrg_Rsp_PDU IBSBattCrnkData_Rsp_PDU IBSBattLINOffData_Rsp_PDU IBSBattStatusData_Rsp_PDU IBSCfgWakeupData_Rsp_PDU IBSCurrentFOMData_Rsp_PDU IBSDiagDet_Rsp_PDU IBSMeasuredTemp_Rsp_PDU IBSMinCrnkData_Rsp_PDU IBSMVISOFData_Rsp_PDU IBSSOCData_Rsp_PDU IBSVoltageFOMData_Rsp	 >=12,500.00 milliseconds >=12,500.00 milliseconds >=12,500.00 milliseconds >=12,500.00 milliseconds >=12,500.00 milliseconds >=12,500.00 milliseconds >=12,500.00 milliseconds >=12,500.00 milliseconds >=10,625.00 milliseconds >=10,625.00 milliseconds >=12,500.00 milliseconds >=10,625.00 milliseconds >=12,500.00 milliseconds >=12,500.00	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory:	 CbTRUE (CbTRUE indicates enabled) CbTRUE (CbTRUE indicates enabled) CbTRUE (CbTRUE indicates present) >=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	LIN bus communication executes in 250ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			_PDU	milliseconds	Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From ECM/ PCM	U0401	This DTC monitors for an error in communication with the ECM.	Any of the Alive Rolling Counts, Protection Values, Checksum Values, or Cyclic Redundancy Check signal values listed below are incorrect for: SD19P_ARC: SrlDat19_Prtctd: TEGP_ARC: TrnsEstGr_Prtctd: SD18P_ARC: SrlDat18_Prtctd: VSANDP_ARC: Veh SpdAvg NDrvn_P rtctd: VSADP_ARC: Veh SpdAvg Drvn_P rtctd: SD21P_ARC:	8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			SrlDat21_Prtctd: SrlDat26_Prtctd: SD22P_ARC: SrlDat22_Prtctd: SD23P_ARC: SrlDat23_Prtctd: SD25P_ARC: SrlDat25_Prtctd:	18 sample counts 15 fail counts out of 16 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Brake System Control Module	U0418	This DTC monitors for an error in communication with the BSCM.	Any of the Alive Rolling Counts, Protection Values, Checksum Values, or Cyclic Redundancy Check signal values listed below are incorrect for: SD14P_ARC: SrlDat14_Prtctd: SD15P_ARC: SrlDat15_Prtctd: SD16P_ARC: SrlDat16_Prtctd:	15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Gateway A	U0447	This DTC monitors for an error in communication with the CGM.	Any of the Alive Rolling Counts, Protection Values, Checksum Values, or Cyclic Redundancy Check signal values listed below are incorrect for: BSPMP_ARC: BkupSysPwrMode_Prtctd:	15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Radio	U0485	This DTC monitors for an error in communication with the CSM	Any of the Alive Rolling Counts, Protection Values, Checksum Values, or Cyclic Redundancy Check signal values listed below are incorrect for: SD226_ARC: SD265_ARC: SD264_ARC: SD216_ARC: SD225_ARC: SD223_ARC: SD213_ARC: SD214_ARC: SD221_ARC: HMIGI3P_ARC: HMIGenInfo3_Prtctd:	8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts 8 fail counts out of	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			SD163_ARC:	10 sample counts				
			SD220_ARC:	8 fail counts out of 10 sample counts				
			SD219_ARC:	8 fail counts out of 10 sample counts				
			SD218_ARC:	8 fail counts out of 10 sample counts				
			HVACICR1_ARC:	8 fail counts out of 10 sample counts				
			HVACICR1_CS:	14 fail counts out of 18 sample counts				
			HVACICR2_ARC:	8 fail counts out of 10 sample counts				
			HVACICR2_CS:	14 fail counts out of 18 sample counts				
			SD212_ARC:	8 fail counts out of 10 sample counts				
			SD215_ARC:	8 fail counts out of 10 sample counts				
			SD222_ARC:	8 fail counts out of 10 sample counts				
			SD224_ARC:	8 fail counts out of 10 sample counts				
			SD217_ARC:	8 fail counts out of 10 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Battery Monitor Module	U04B1	This DTC monitors for an internal error or error in communication with the Battery Monitor Signal	Any of the Alive Rolling Counts signal values listed below are incorrect for: AmpHrsChrgdARC: AmpHrsDischrgdARC: BatCrnkDatARC: BatLINOffDatARC: BatStsDatARC: CfgWkupDatARC: IBSCurrOORAndRatIFOMARC: IBSDiagDetARC: MsrdTempARC: MinCrnkgDatARC: MVIAndSOFDatARC: BatSOCDatARC:	8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Fastest periodic communication rate to Battery Monitor Module on LIN bus executes at 250ms.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			IBSVItgFOMARC:	8 fail counts out of 10 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Left Front Temperature Actuator	U0659	This DTC monitors for a loss of communication with the Left Front Temperature Actuator on the LIN bus.	Message is not received from device for AHDA03_Rsp_PDU	 >=11,500.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run If power mode = Accessory:	 CbTRUE (CbTRUE indicates enabled) CbTRUE (CbTRUE indicates enabled) CbTRUE (CbTRUE indicates enabled) >=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	LIN bus communication executes in 600ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Right Front Temperature Actuator	U065A	This DTC monitors for a loss of communication with the Right Front Temperature Actuator on the LIN bus.	Message is not received from device for AHDA05_Rsp_PDU	 >=11,500.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run If power mode = Accessory:	 CbTRUE (CbTRUE indicates enabled) CbTRUE (CbTRUE indicates enabled) CbTRUE (CbTRUE indicates enabled) >=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	LIN bus communication executes in 600ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Virtual Cockpit Unit Invalid Data Received from Fully Integrated Display Module Touchscreen	U13F9	This diagnostic monitors invalid touchscreen data received from the Virtual Cockpit Display (VCD) module. The Vehicle Cockpit Unit (VCU, smart device) monitors invalid data received from the VCD over I2C protocol, and communicates instantaneous failures to the diagnosing controller where the diagnostic is matured and stored in a DTC.	Invalid VCD data detected from Diagnostic Status 1 or Diagnostic Status 2 packets (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	 = TRUE U164E, U0485	4 seconds out of a 5 seconds window	Type B, 2 Trips
			Invalid VCD data detected from Touch Diagnostic Status packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	 = TRUE U164E, U0485	4 seconds out of a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Vehicle Cockpit Unit Invalid Data Received from Fully Integrated Display Module Switchbank	U13FA	This diagnostic monitors invalid switchbank data received from the Virtual Cockpit Display (VCD) module. The Vehicle Cockpit Unit (VCU, smart device) monitors invalid data received from the VCD over I2C protocol, and communicates instantaneous failures to the diagnosing controller where the diagnostic is matured and stored in a DTC.	Invalid VCD data detected from the Blower Circuit 1 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	Type B, 2 Trips
			Invalid VCD data detected from the Blower Circuit 2 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	
			Invalid VCD data detected from the Front Left Temperature Circuit 1 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	
			Invalid VCD data detected from the Front Left Temperature Circuit 2 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Invalid VCD data detected from the Front Left Temperature Circuit 3 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	
			Invalid VCD data detected from the Front Right Temperature Circuit 1 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	
			Invalid VCD data detected from the Front Right Temperature Circuit 2 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	
			Invalid VCD data detected from the Front Right Temperature Circuit 3 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	
			Invalid VCD data detected from the Message 1 packet fas evaluated by		Diagnostic is enabled VCU Data Received from		40 seconds out of a 50 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			the VCU smart device)	= TRUE	VCD The VCU has received a new Message 1 packet from the VCD (i.e. Total Evaluations Counter is not equal to the previous received value of Total Evaluations Counter) The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485		
			Invalid VCD data detected from the Message 2 packet (as evaluated by the VCU smart device)	= TRUE	Diagnostic is enabled VCU Data Received from VCD The VCU has received a new Message 2 packet from the VCD (i.e. Total Evaluations Counter is not equal to the previous received value of Total Evaluations Counter) The integrity of the CAN communication is good No DTCs:	= TRUE U164E, U0485	40 seconds out of a 50 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from HVAC Temp Motor Front 1	U140F	This DTC monitors for an internal error or error in communication with the HVAC Temp Motor Front 1	Any of the Alive Rolling Counts signal values listed below are incorrect for: AHDA03.ARC:	8 fail counts out of 10 sample counts	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	LIN bus communication executes in 600ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from HVAC Temp Motor Front 2	U1410	This DTC monitors for an internal error or error in communication with the HVAC Temp Motor Front 2	Any of the Alive Rolling Counts signal values listed below are incorrect for: AHDA05.ARC:	8 fail counts out of 10 sample counts	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	LIN bus communication executes in 600ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Body Control Module Local Interconnect Network 6	U152A	This DTC monitors for a loss of communication on the LIN bus.	All Slaves calibrated as present on this LIN bus are reporting Loss of Communication.		General Enable Criteria:		LIN bus communication executes in 600ms loop.	Type B, 2 Trips
					Diagnostic is enabled	CbTRUE (CbTRUE indicates enabled)		
					LIN channel is enabled	CbTRUE (CbTRUE indicates enabled)		
					LIN module is initialized			
					Time since power-up reset, running reset, recovery from under/over voltage condition	>=5,000 milliseconds		
					All below criteria have been met for	>=3,000 milliseconds		
					Accessory mode to off mode not pending			
					Battery voltage	>11.00 Volts		
					Controller is an OBD controller Or Battery Voltage	<=18.00 Volts		
					Controller type: OBD Controller			
					If power mode = Run/ Crank:			
					If power mode = Accessory:			
					Off key cycle diagnostics are enabled Or Controller is an OBD	CbFALSE (CbTRUE indicates enabled)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Body Control Module Local Interconnect Network 9	U152D	This DTC monitors for a loss of communication on the LIN bus.	All Slaves calibrated as present on this LIN bus are reporting Loss of Communication.		General Enable Criteria:		LIN bus communication executes in 250ms loop.	Type B, 2 Trips
					Diagnostic is enabled	CbTRUE (CbTRUE indicates enabled)		
					LIN channel is enabled	CbTRUE (CbTRUE indicates enabled)		
					LIN module is initialized			
					Time since power-up reset, running reset, recovery from under/over voltage condition	>=5,000 milliseconds		
					All below criteria have been met for	>=3,000 milliseconds		
					Accessory mode to off mode not pending			
					Battery voltage	>11.00 Volts		
					Controller is an OBD controller Or Battery Voltage	<=18.00 Volts		
					Controller type: OBD Controller			
					If power mode = Run/ Crank:			
					Power Mode is run			
					If power mode = Accessory:			
					Off key cycle diagnostics are enabled	CbFALSE (CbTRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Brake System Control Module 1 on CAN Bus 2	U1610	This DTC monitors for a Lost Communication with Brake System Control Module on CAN Bus 2 error as determined by the BCM	Message is not received from controller for Message $03B Message $27B Message $369 Message $3A8 Message $5CD	 >10,025.00 milliseconds >10,250.00 milliseconds >10,625.00 milliseconds >10,625.00 milliseconds >12,500.00 milliseconds	General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active If message is on Bus 9: U0078 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage	 >=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 10 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Engine Control Module on CAN Bus 2	U1611	This DTC monitors for a Lost Communication with Engine Control Module on CAN Bus 2 error as determined by the BCM.	Message is not received from controller for Message $514 Message $0E2 Message $516 Message $268 Message $02F Message $049 Message $064 Message $262 Message $266 Message $267 Message $36F Message $521 Message $5CE	 >12,500.00 milliseconds >10,062.50 milliseconds >12,500.00 milliseconds >10,250.00 milliseconds >10,031.25 milliseconds >10,031.25 milliseconds >10,031.25 milliseconds >10,250.00 milliseconds >10,250.00 milliseconds >10,250.00 milliseconds >10,625.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds	General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active If message is on Bus 9: U0078 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage	 >=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 10 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Message $5EB Message $032 Message $2D1 Message $2D3 Message $2DA	>12,500.00 milliseconds >10,031.25 milliseconds >10,250.00 milliseconds >10,250.00 milliseconds >10,250.00 milliseconds	Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Central Gateway Module on CAN Bus 9	U1627	This DTC monitors for a loss of communication with Central Gateway Module.	Message is not received from controller for Message $2D0 Message $370 Message $3A4 Message $5CC Message $5D7 Message $04B Message $700 Message $585 Message $598 Message $4F3 Message $5BB Message $5F8 Message $5F9	 > 10,250.00 milliseconds > 10,625.00 milliseconds > 10,625.00 milliseconds > 12,500.00 milliseconds > 12,500.00 milliseconds > 10,025.00 milliseconds > 12,500.00 milliseconds > 12,500.00 milliseconds > 12,500.00 milliseconds > 12,500.00 milliseconds > 12,500.00 milliseconds > 12,500.00 milliseconds > 12,500.00 milliseconds	General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active If message is on Bus 9: U0078 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage	 >=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 10 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Center Stack Module/Low Radio/ Vehicle Cockpit Unit on CAN Bus 5	U164E	This DTC monitors for a loss of communication with the Center Stack Module, Low Radio, or Vehicle Cockpit Unit.	Message is not received from controller for Message $2E0 Message $4F0 Message $4F1 Message $4F2 Message $505 Message $519 Message $539 Message $53B Message $53D Message $5B6 Message $5B7 Message $5D0 Message $708	 >10,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds	General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active If message is on Bus 9: U0078 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage	 >=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 10 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Message $709 Message $70A Message $4DF Message $4E0 Message $71B Message $71C Message $28B Message $4EC Message $4F4 Message $529 Message $707 Message $713	>12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >10,250.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds >12,500.00 milliseconds	Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With ECM/PCM A on Bus B	U1818	This DTC monitors for a Lost Communication with Engine Control Module on CAN Bus B error as determined by the BCM.	Message is not received from controller for Message $2C3	 >10,250.00 milliseconds	General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active If message is on Bus 9: U0078 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage	 >=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 10 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled) >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Key Table Not Provisioned / Authoritative Counter At Maximum	U1960	This DTC indicates that the ECU security peripheral key slots are not provisioned OR ECU message authenticatioon Authoritative Counters are at MAX value	During controller initialization:
			
			IF (Any Security Peripheral Key Slot reports as Empty)
			-OR-
			(Any Authoritative Counter is at MAX value)
			
			During controller operation:
			
			IF (A Security Peripheral Key Slot reports as Empty)
			-OR-
			(An Authoritative Counter is at MAX value)
					Calibration enable	= CbTRUE Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Security Peripheral Performance	U1961	This DTC indicates that the ECU security peripheral has reported that it has failed.	The ECU security peripheral reports that the security peripheral hardware has failed.		Calibration enable	= CbTRUE Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Unable to Authenticate Serial Data Message	U1962	This DTC indicates that serial data message authentication on any key slot has failed a configurable number of times this key cycle.	Message authentication on a single key slot has failed for	60 seconds	Calibration enable	= CbTRUE Boolean	60 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Vehicle Cockpit Unit Lost Communication with Fully Integrated Display Module Touchscreen	U223B	This diagnostic monitors loss of communication of touchscreen data from the Virtual Cockpit Display (VCD) module. The Vehicle Cockpit Unit (VCU, smart device) monitors loss of communication from the VCD over I2C protocol, and communicates communication status to the diagnosing controller (where the diagnostic is matured and stored in a DTC) when the VCU has not received the message for2.5x of its periodic rate.	Data received status from VCD Diagnostic Status 1 or Diagnostic Status 2 packets (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	4 seconds out of a 5 seconds window	Type B, 2 Trips
			Data received status from VCD Touch Diagnostic Status packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	4 seconds out of a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Vehicle Cockpit Unit Lost Communication with Fully Integrated Display Module Switchbank	U223C	This diagnostic monitors loss of communication of switchbank data from the Virtual Cockpit Display (VCD) module. The Vehicle Cockpit Unit (VCU, smart device) monitors loss of communication from the VCD over I2C protocol, and communicates communication status to the diagnosing controller (where the diagnostic is matured and stored in a DTC) when the VCU has not received the message for2.5x of its periodic rate.	Data received status from VCD the Blower Circuit 1 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	Type B, 2 Trips
			Data received status from VCD the Blower Circuit 2 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	
			Data received status from VCD the Front Left Temperature Circuit 1 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	
			Data received status from VCD the Front Left Temperature Circuit 2 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	
			Data received status from VCD the Front Left Temperature Circuit 3 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	
			Data received status from VCD the Front Right Temperature Circuit 1 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Data received status from VCD the Front Right Temperature Circuit 2 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	
			Data received status from VCD the Front Right Temperature Circuit 3 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	
			Data received status from VCD the Message 1 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	
			Data received status from VCD the Message 2 packet (as evaluated by the VCU smart device)	= FALSE	Diagnostic is enabled The integrity of the CAN communication is good No DTCs:	U164E, U0485	40 seconds out of a 50 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Input Power Circuit A/B Correlation	U3018	This diagnostic verifies that both (A and B) control module input power voltage sensors (when there are two) are neither inappropriately high nor low. It compares the sensed control module voltage A with sensed control module voltage B. If the absolute value of the difference between voltage A and B is greater than the failure threshold for sufficient time, the diagnostic will fail.	Difference between 12V Battery Power Circuit A and 12V Battery Power Circuit B	> 4.00	PowerA - Power B Correlation monitoring enable = TRUE Battery Present is **CbTRUE** Starter Motor NOT Engaged	CbTRUE CbTRUE = FALSE	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Bus-Off detected on Communication CAN Bus 1	U007500	This fault is set if Communication CAN Bus 1 enters the Bus-Off state	Bus Off Event on CAN Bus 1 FOR	= TRUE >= 5.0 seconds	U007500_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Control Module Communication Bus Off Power Mode Time	2.0 sec for pass 5.0 sec for fail	Type B 2 Trips
Bus-Off detected on Communication CAN Bus 2	U007300	This fault is set if Communication CAN Bus 2 enters the Bus-Off state	Bus Off Event on CAN Bus 2 FOR	= TRUE >= 5.0 seconds	U007300_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Control Module Communication Bus Off Power Mode Time	2.0 sec for pass 5.0 sec for fail	Type B 2 Trips
Bus-Off detected on Communication CAN Bus 3	U007400	This fault is set if Communication CAN Bus 3 enters the Bus-Off state	Bus Off Event on CAN Bus 3 FOR	= TRUE >= 5.0 seconds	U007400_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Control Module Communication Bus Off Power Mode Time	2.0 sec for pass 5.0 sec for fail	Type B 2 Trips
Bus-Off detected on Communication CAN Bus 5	U007B00	This fault is set if Communication CAN Bus 5 enters the Bus-Off state	Bus Off Event on CAN Bus 5 FOR	= TRUE >= 5.0 seconds	U007B00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Control Module Communication Bus Off Power Mode Time	2.0 sec for pass 5.0 sec for fail	Type B 2 Trips
Bus-Off detected on Communication CAN Bus 9	U007800	This fault is set if Communication CAN Bus 9 enters the Bus-Off state	Bus Off Event on CAN Bus 9 FOR	= TRUE >= 5.0 seconds	U007800_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Control Module Communication Bus Off Power Mode Time	2.0 sec for pass 5.0 sec for fail	Type B 2 Trips
Lost Communication with DEFC Detected	U010E00	This monitoring shall check a supervised message from the DEFC for communication status. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U010E00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with ECP_MC Detected	U011000	This monitoring shall check a supervised message from the ECP_MC for communication status. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U011000_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with BSM_MH Detected	U011100	This monitoring shall check a supervised message from the BSM_MH for communication status. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U011100_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with BCM Detected	U014000	This monitoring shall check a supervised message from the BCM for communication status. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U014000_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with HVAC_? Detected	U016400	This monitoring shall check a supervised message from the HVAC_? for communication status. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U016400_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with LIBI Detected	U01BF00	This monitoring shall check a supervised message from the LIBI for communication status. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U01BF00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with VICM Detected on CAN2	U160D00	This monitoring shall check a supervised message from the VICM for communication status on CAN channel 2. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U160D00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with BSM Detected on CAN3	U160E00	This monitoring shall check a supervised message from the BSM for communication status on CAN channel 3. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U160E00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with EBCM Detected on CAN2	U161000	This monitoring shall check a supervised message from the EBCM for communication status on CAN channel 2. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U161000_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with ECM Detected on CAN2	U161100	This monitoring shall check a supervised message from the ECM for communication status on CAN channel 2. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U161100_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with ECP_X1Detected on CAN2	U161200	This monitoring shall check a supervised message from the ECP_X1for communication status on CAN channel 2. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U161200_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with ECP_X1Detected on CAN3	U161300	This monitoring shall check a supervised message from the ECP_X1for communication status on CAN channel 3. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U161300_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with VICM Detected on CAN9	U163500	This monitoring shall check a supervised message from the VICM for communication status on CAN channel 9. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U163500_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with EBCM Detected on CAN3	U163900	This monitoring shall check a supervised message from the EBCM for communication status on CAN channel 3. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U163900_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with SIB Detected on CAN1	U163C00	This monitoring shall check a supervised message from the SIB for communication status on CAN channel 1. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U163C00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with TCM Detected on CAN2	U164300	This monitoring shall check a supervised message from the TCM for communication status on CAN channel 2. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U164300_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with CSM Detected on CAN5	U164E00	This monitoring shall check a supervised message from the TCM for communication status on CAN channel 2. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U164E00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with VECM Detected on CAN2	U165B00	This monitoring shall check a supervised message from the VECM for communication status on CAN channel 2. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U165B00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with VECM Detected on CAN9	U165C00	This monitoring shall check a supervised message from the VECM for communication status on CAN channel 9. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U165C00_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Lost Communication with ECM Detected on CAN3	U181800	This monitoring shall check a supervised message from the ICCM for communication status. If the CGM has not received the message per the malfunction criteria and threshold values and subject to the secondary parameters and enable conditions, then this fault shall be set.	Supervised message not received FOR WHERE nominal periodic rate with an additional delay	= TRUE >= 2.5 x nominal periodic rate = 1 second = 4 seconds	U181800_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= k_Lost Communication Power Mode Time	6.5 sec	Type B 2 Trips
Key Table Not Provisioned	U196000	Upon start up, if the key table has not been provisioned, this fault is set. If the table is, or becomes, provisioned, it is cleared.	All key slots are provisioned OR Receipt of ERC_KEY_EMPTY from security peripheral	= False	In Vehicle Message Authentication Supported Vehicle Supply Voltage	= True >= k_Battery Voltage Low Threshold (7V)	250 msec	Type B 2 Trips
Security Peripheral Performance	U196100	This diagnostic monitors the security peripheral and if the security peripheral indicates a fault or the key table is not provisioned, then this fault is set. Otherwise, it is cleared.	Security peripheral has internal fault	= True	Vehicle Supply Voltage Any participating Partial Network FOR	>= k_Battery Voltage Low Threshold (7V) = Active >= 5 seconds	Immediate upon fault. 50 msec task interval.	Type B 2 Trips
Serial Data Message Authentication Failure	U196200	This diagnostic monitors for serial data message authentication failures. If X (default = 3) failures occur on a particular key slot, the fault is set. If X-1 messages on a failed key slot authenticate, the fault is cleared.	Serial data authentication failure instances on a key slot	>= K_ERRH_C_FailedAuthentication Counter for the slot	In Vehicle Message Authentication Supported Vehicle Supply Voltage U196100 is set Any participating Partial Network FOR	= True >= k_Battery Voltage Low Threshold (7V) = False = Active >= 5 seconds	Depends on calibration setting (count of authentication errors).	Type B 2 Trips
BCM Invalid Data	U042200	This diagnostic monitors for serial data messages from the BCM with safety, security, protection or continuous operation failures. An adjustable debounce strategy (ex. X of Y) is used.	BCM serial data - MAC or ARC - failure instances	>= X of Y	U042200_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= 5 seconds	Depends on calibration setting (count of invalid messages).	Type B 2 Trips

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
ECM Invalid Data	U040100	This diagnostic monitors for serial data messages from the ECM with safety, security, protection or continuous operation failures. An adjustable debounce strategy (ex. X of Y) is used.	ECM serial data - MAC or ARC - failure instances	>= X of Y	U040100_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= 5 seconds	Depends on calibration setting (count of invalid messages).	Type B 2 Trips
TCM Invalid Data	U040200	This diagnostic monitors for serial data messages from the TCM with safety, security, protection or continuous operation failures. An adjustable debounce strategy (ex. X of Y) is used.	TCM serial data - MAC or ARC - failure instances	>= X of Y	U040200_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= 5 seconds	Depends on calibration setting (count of invalid messages).	Type B 2 Trips
BSCM Invalid Data	U041800	This diagnostic monitors for serial data messages from the BSCM with safety, security, protection or continuous operation failures. An adjustable debounce strategy (ex. X of Y) is used.	BSCM serial data - MAC or ARC - failure instances	>= X of Y	U041800_ENABLE Vehicle Supply Voltage Any participating Partial Network FOR	= "enabled" >= k_Battery Voltage Low Threshold (7V) = Active >= 5 seconds	Depends on calibration setting (count of invalid messages).	Type B 2 Trips
ECU Identification Self Learn Not Completed	U197700	This diagnostic indicates when the self learn execution has not completed.	Self learn execution not completed	= TRUE	k_CGM Self Learn Did Not Execute Diagnostic Enable Vehicle Supply Voltage Any participating Partial Network FOR	= True >= k_Battery Voltage Low Threshold (7V) = Active >= k_CGM Self Learn Did Not Execute Power Mode Time	Monitored at task interval of 50 msec.	Type B 2 Trips
ECU Identification Self Learn Invalid	U198B00	This diagnostic indicates when the ECU Identification List has become corrupted or the VIN does not match.	ECU Identification List NVM Corruption Diagnostic Fault OR VIN Mismatch Fault	= Active = Active	k_CGM Self Learn Invalid Diagnostic Enable Vehicle Supply Voltage Any participating Partial Network FOR	= True >= k_Battery Voltage Low Threshold (7V) = Active >= k_CGM Self Learn Invalid Power Mode Time	Monitored at task interval of 100 msec.	Type B 2 Trips
Control Module General Memory Failure	U35B900	The CGM shall mature this DTC when Self-Learn has completed but the diagnostic address list cannot be restored from NVM.	Diagnostic address list cannot be restored from NVM	= TRUE	U35B900_ENABLE Vehicle Supply Voltage	= "enabled" >= k_Battery Voltage Low Threshold (7V)	At start-up (ignition off to run or propulsion)	Type B 2 Trips
Control Module Internal Electronic Failure	P060700	This DTC is set when one or more of the following occur: - Ethernet switch failure - Energy reserve capacitor is not present - Energy reserve capacitor discharge failure - Energy reserve capactitor voltage is low	Ethernet switch failure OR ER capacitor not present OR ER capacitor discharge failure OR ER capacitor voltage is low	= TRUE = TRUE = TRUE = TRUE	Vehicle Supply Voltage	>= 6V	5 seconds for Ethernet switch. 2 seconds for ER capacitor voltage low. 100 msec for the others.	Type B 2 Trips
Internal Control Module Random Access Memory (RAM)	P060400	This DTC is set when a RAM ECC failure is detected. This is run upon start-up.	RAM ECC failure detected	= TRUE	None.		Immediately upon start-up when fault detected.	Type B 2 Trips
Internal Control Module Read Only Memory (ROM)	P060500	This DTC is set when a ROM ECC failure is detected. This is run upon start-up.	ROM ECC failure detected	= TRUE	None.		Immediately upon start-up when fault detected.	Type B 2 Trips

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Vehicle Identification Number - Not Programmed	U2C9100	At the beginning of each ignition cycle, confirm that the VIN contains valid characters.	Any character in the VIN	= {0x00 - 0x29, 0x40, 0x49, 0x4F, 0x51, 0x5B - OxFF}	U2C9100_ENABLE	= "enabled"	Immediately upon start-up when fault detected.	Type B 2 Trips
Vehicle Identification Number - Invalid, Incompatible or Mismatches Published VIN	C054600	At the beginning of each ignition cycle, confirm that the VIN has been programmed and matches what is sent on CAN9.	All characters in the VIN	= VIN signal sent via CAN9	C054600_ENABLE	= "enabled"	Immediately upon start-up when fault detected.	Type B 2 Trips

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_OPEN_FRONT_LEFT	C0502	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris ASIC sets FL Open Sensor bit = TRUE when High side current < 3.5mA	Polaris ASIC Open Sensor Bit= True	•Wheel speed sensor supply is enabled	100 ms	Type A MIL Illumination.
WSS_OPEN_FRONT_RIGHT	C0508	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris ASIC sets FR Open Sensor bit = TRUE when High side current < 3.5mA	Polaris ASIC Open Sensor Bit= True	•Wheel speed sensor supply is enabled	100 ms	Type A MIL Illumination.
WSS_OPEN_REAR_LEFT	C050E	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris ASIC sets RL Open Sensor bit = TRUE when High side current < 3.5mA	Polaris ASIC Open Sensor Bit= True	•Wheel speed sensor supply is enabled	100 ms	Type A MIL Illumination.
WSS_OPEN_REAR_RIGHT	C0514	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris ASIC sets RR Open Sensor bit = TRUE when High side current < 3.5mA	Polaris ASIC Open Sensor Bit= True	•Wheel speed sensor supply is enabled	100 ms	Type A MIL Illumination.
WSS_SHORT_FRONT_LEFT	C0503	This monitor checks if: • HS Shorted to Battery • LS Shorted to Battery • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris Asic sets XX HS OC = TRUE when High side current > 40mA	High side over current bit= True OR High side short to battery bit= True OR Low side over current bit= True OR Low side short to ground bit= True	• Wheel speed sensor supply is enabled	100 ms	Type A MIL Illumination.
WSS_SHORT_FRONT_RIGHT	C0509	This monitor checks if: • HS Shorted to Battery • LS Shorted to Battery • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris Asic sets XX HS OC = TRUE when High side current > 40mA	High side over current bit= True OR High side short to battery bit= True OR Low side over current bit= True OR Low side short to ground bit= True	• Wheel speed sensor supply is enabled	100 ms	Type A MIL Illumination.
WSS_SHORT_REAR_LEFT	C050F	This monitor checks if: • HS Shorted to Battery • LS Shorted to Battery • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris Asic sets XX HS OC = TRUE when High side current > 40mA	High side over current bit= True OR High side short to battery bit= True OR Low side over current bit= True OR Low side short to ground bit= True	• Wheel speed sensor supply is enabled	100 ms	Type A MIL Illumination.
WSS_SHORT_REAR_RIGHT	C0515	This monitor checks if: • HS Shorted to Battery • LS Shorted to Battery • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris Asic sets XX HS OC = TRUE when High side current > 40mA	High side over current bit= True OR High side short to battery bit= True OR Low side over current bit= True OR Low side short to ground bit= True	• Wheel speed sensor supply is enabled	100 ms	Type A MIL Illumination.
WSS--LS_SHORT---TO_GND_FRONT_LEFT	C0502	This monitor checks if: • LS Shorted to Ground • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris Asic sets XX LS SHORT TO GROUND spi bit= TRUE	• Polaris Asic sets XX LS SHORT TO GROUND spi bit= TRUE	•Wheel speed sensor supply is enabled • Tested only during power up or after clear DTC.	100 ms	Type A MIL Illumination.
WSS--LS_SHORT---TO_GND_FRONT_RIGHT	C0508	This monitor checks if: • LS Shorted to Battery • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris Asic sets XX LS SHORT TO GROUND spi bit= TRUE	• Polaris Asic sets XX LS SHORT TO GROUND spi bit= TRUE	•Wheel speed sensor supply is enabled • Tested only during power up or after clear DTC.	100 ms	Type A MIL Illumination.
WSS_LS_SHORT_TO_GND_REAR_LEFT	C050E	This monitor checks if: • LS Shorted to Battery • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris Asic sets XX LS SHORT TO GROUND spi bit= TRUE	• Polaris Asic sets XX LS SHORT TO GROUND spi bit= TRUE	•Wheel speed sensor supply is enabled • Tested only during power up or after clear DTC.	100 ms	Type A MIL Illumination.
WSS_LS_SHORT_TO_GND_REAR_RIGHT	C0514	This monitor checks if: • LS Shorted to Battery • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Polaris Asic sets XX LS SHORT TO GROUND spi bit= TRUE	• Polaris Asic sets XX LS SHORT TO GROUND spi bit= TRUE	•Wheel speed sensor supply is enabled • Tested only during power up or after clear DTC.	100 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_MISSING_FRONT_LEFT	C0505	This monitor checks if: • Wheel speed sensor not mounted correctly. • Wheel speed sensor to tone-ring gap out of tolerance. • Demagnetized tone-ring.	Missing Wheel Speed Sensor If one sensor shows a speed of less than 1.5 km/h (standstill detection threshold) while the other sensors indicate a speed greater than 6 km/h, then a missing sensor signal fault occurs. The detection is dependant on the speed of the wheels showing a valid signal. If the average speed of moving wheel (6km/h) is greater than 50 km/h and/or any undroven wheel speed is greater than 6km/h, the fault detection time is faster. The entire test sequence is bypassed whenever unexpected wheel acceleration is detected to induce ABS (DRP) activation. The purpose of this handling is to avoid erroneous fault detection. Special case is during TC, ABS or MOCO then the detection is run and the detection time is increased. The failsafe will not run in case • exactly one axle is moving (other axle is standstill) while the moving axle shows an average velocity of less than 10km/h (to prevent setting Missing Wss faults on a roller bench). • the dynamic failsafe is currently disabled because the system is currently in Diagnostic mode. Counter type: Counter up and the fault counter reset If all sensors show a speed greater than 6 km/h or the vehicle is in standstill (all sensors lowerthan 1.5 km/h) Fault maturation time for one Wss missing: a. TC active: 60 sec b. ABS or MOCO not active: 3 sec. c. ABS or MOCO active: 15 sec Fault maturation time for two Wss missing: a. ABS or MOCO active: 15 sec b. If ABS or MOCO not active: 1. If undriven wheel is moving then: Fault maturation if velocity greater than 50 km/hr: 3 sec. If velocity is less than 50 km/hr then fault maturation is: 10 sec. 2. If driven wheel is moving then: Fault maturation if velocity greater than 50 km/hr: 10 sec. If velocity is less than 50 km/hr then fault maturation is: 30 sec. Fault maturation time for three Wss missing: 120 sec	If one sensor shows a speed of less than 1.5 km/h (standstill detection threshold) while the other sensors indicate a speed greater than 6 km/h, then a missing sensor signal fault occurs. The detection is dependant on the speed of the wheels showing a valid signal. If the average speed of moving wheel (6km/h) is greater than 50 km/h and/or any undriven wheel speed is greater than 6km/h the fault detection time is faster. The entire test sequence is bypassed whenever unexpected wheel acceleration is detected to induce ABS (DRP) activation. The purpose of this handling is to avoid erroneous fault detection. Special case is during ABS, only if the wheel is in pressure dump state, then the detection is run and the detection time is increased.	• Wheel speed sensor supply is enabled. • No Ohmic wheel speed sensor failure present. • No Wss Erratic or Wss Dropout fault present • At least one WSS > 6kph • No excessive high or low voltage • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	3-120s depending on number of missing wss and situation	Type B. MIL Illumination.
WSS--MISSING--FRONT--RIGHT	C050B	This monitor checks if: • Wheel speed sensor not mounted correctly. • Wheel speed sensor to tone-ring gap out of tolerance. • Demagnetized tone-ring.	Missing Wheel Speed Sensor If one sensor shows a speed of less than 1.5 km/h (standstill detection threshold) while the other sensors indicate a speed greater than 6 km/h, then a missing sensor signal fault occurs. The detection is dependant on the speed of the wheels showing a valid signal. If the average speed of moving wheel (6km/h) is greater than 50 km/h and/or any undroven wheel speed is greater than 6km/h, the fault detection time is faster. The entire test sequence is bypassed whenever unexpected wheel acceleration is detected to induce ABS (DRP) activation. The purpose of this handling is to avoid erroneous fault detection. Special case is during TC, ABS or MOCO then the detection is run and the detection time is increased. The failsafe will not run in case • exactly one axle is moving (other axle is standstill) while the moving axle shows an average velocity of less than 10km/h (to prevent setting Missing Wss faults on a roller bench). • the dynamic failsafe is currently disabled because the system is currently in Diagnostic mode. Counter type: Counter up and the fault counter reset If all sensors show a speed greater than 6 km/h or the vehicle is in standstill (all sensors lowerthan 1.5 km/h) Fault maturation time for one Wss missing: a. TC active: 60 sec	If one sensor shows a speed of less than 1.5 km/h (standstill detection threshold) while the other sensors indicate a speed greater than 6 km/h, then a missing sensor signal fault occurs. The detection is dependant on the speed of the wheels showing a valid signal. If the average speed of moving wheel (6km/h) is greater than 50 km/h and/or any undriven wheel speed is greater than 6km/h the fault detection time is faster. The entire test sequence is bypassed whenever unexpected wheel acceleration is detected to induce ABS (DRP) activation. The purpose of this handling is to avoid erroneous fault detection. Special case is during ABS, only if the wheel is in pressure dump state, then the detection is run and the detection time is increased.	• Wheel speed sensor supply is enabled. • No Ohmic wheel speed sensor failure present. • No Wss Erratic or Wss Dropout fault present • At least one WSS > 6kph • No excessive high or low voltage • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	3-120s depending on number of missing wss and situation	Type B. MIL Illumination.
WSS--MISSING_REAR_LEFT	C0511	This monitor checks if: • Wheel speed sensor not mounted correctly. • Wheel speed sensor to tone-ring gap out of tolerance. • Demagnetized tone-ring.	Missing Wheel Speed Sensor If one sensor shows a speed of less than 1.5 km/h (standstill detection threshold) while the other sensors indicate a speed greater than 6 km/h, then a missing sensor signal fault occurs. The detection is dependant on the speed of the wheels showing a valid signal. If the average speed of moving wheel (6km/h) is greater than 50 km/h and/or any undroven wheel speed is greater than 6km/h, the fault detection time is faster. The entire test sequence is bypassed whenever unexpected wheel acceleration is detected to induce ABS (DRP) activation. The purpose of this handling is to avoid erroneous fault detection. Special case is during TC, ABS or MOCO then the detection is run and the detection time is increased. The failsafe will not run in case • exactly one axle is moving (other axle is standstill) while the moving axle shows an average velocity of less than 10km/h (to prevent setting Missing Wss faults on a roller bench). • the dynamic failsafe is currently disabled because the system is currently in Diagnostic mode. Counter type: Counter up and the fault counter reset If all sensors show a speed greater than 6 km/h or the vehicle is in standstill (all sensors lowerthan 1.5 km/h) Fault maturation time for one Wss missing: a. TC active: 60 sec b. ABS or MOCO not active: 3 sec. c. ABS or MOCO active: 15 sec Fault maturation time for two Wss missing: a. ABS or MOCO active: 15 sec b. If ABS or MOCO not active: 1. If undriven wheel is moving then: Fault maturation if velocity greater than 50 km/hr: 3 sec. If velocity is less than 50 km/hr then fault maturation is: 10 sec. 2. If driven wheel is moving then: Fault maturation if velocity greater than 50 km/hr: 10 sec. If velocity is less than 50 km/hr then fault maturation is: 30 sec. Fault maturation time for three Wss missing: 120 sec	If one sensor shows a speed of less than 1.5 km/h (standstill detection threshold) while the other sensors indicate a speed greater than 6 km/h, then a missing sensor signal fault occurs. The detection is dependant on the speed of the wheels showing a valid signal. If the average speed of moving wheel (6km/h) is greater than 50 km/h and/or any undriven wheel speed is greater than 6km/h the fault detection time is faster. The entire test sequence is bypassed whenever unexpected wheel acceleration is detected to induce ABS (DRP) activation. The purpose of this handling is to avoid erroneous fault detection. Special case is during ABS, only if the wheel is in pressure dump state, then the detection is run and the detection time is increased.	• Wheel speed sensor supply is enabled. • No Ohmic wheel speed sensor failure present. • No Wss Erratic or Wss Dropout fault present • At least one WSS > 6kph • No excessive high or low voltage • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	3-120s depending on number of missing wss and situation	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS-MIS SING_REAR_RIGHT	C0517	This monitor checks if: • Wheel speed sensor not mounted correctly. • Wheel speed sensor to tone-ring gap out of tolerance. • Demagnetized tone-ring.	Missing Wheel Speed Sensor If one sensor shows a speed of less than 1.5 km/h (standstill detection threshold) while the other sensors indicate a speed greater than 6 km/h, then a missing sensor signal fault occurs. The detection is dependant on the speed of the wheels showing a valid signal. If the average speed of moving wheel (6km/h) is greater than 50 km/h and/or any undroven wheel speed is greater than 6km/h, the fault detection time is faster. The entire test sequence is bypassed whenever unexpected wheel acceleration is detected to induce ABS (DRP) activation. The purpose of this handling is to avoid erroneous fault detection. Special case is during TC, ABS or MOCO then the detection is run and the detection time is increased. The failsafe will not run in case • exactly one axle is moving (other axle is standstill) while the moving axle shows an average velocity of less than 10km/h (to prevent setting Missing Wss faults on a roller bench). • the dynamic failsafe is currently disabled because the system is currently in Diagnostic mode. Counter type: Counter up and the fault counter reset If all sensors show a speed greater than 6 km/h or the vehicle is in standstill (all sensors lowerthan 1.5 km/h) Fault maturation time for one Wss missing: a. TC active: 60 sec b. ABS or MOCO not active: 3 sec. c. ABS or MOCO active: 15 sec Fault maturation time for two Wss missing: a. ABS or MOCO active: 15 sec b. If ABS or MOCO not active: 1. If undriven wheel is moving then: Fault maturation if velocity greater than 50 km/hr: 3 sec. If velocity is less than 50 km/hr then fault maturation is: 10 sec. 2. If driven wheel is moving then: Fault maturation if velocity greater than 50 km/hr: 10 sec. If velocity is less than 50 km/hr then fault maturation is: 30 sec. Fault maturation time for three Wss missing: 120 sec	If one sensor shows a speed of less than 1.5 km/h (standstill detection threshold) while the other sensors indicate a speed greater than 6 km/h, then a missing sensor signal fault occurs. The detection is dependant on the speed of the wheels showing a valid signal. If the average speed of moving wheel (6km/h) is greater than 50 km/h and/or any undriven wheel speed is greater than 6km/h the fault detection time is faster. The entire test sequence is bypassed whenever unexpected wheel acceleration is detected to induce ABS (DRP) activation. The purpose of this handling is to avoid erroneous fault detection. Special case is during ABS, only if the wheel is in pressure dump state, then the detection is run and the detection time is increased.	• Wheel speed sensor supply is enabled. • No Ohmic wheel speed sensor failure present. • No Wss Erratic or Wss Dropout fault present • At least one WSS > 6kph • No excessive high or low voltage • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	3-120s depending on number of missing wss and situation	Type B. MIL Illumination.
WSS_ERRATIC_FRONT_LEFT	C0504	This monitor checks if: • Wheel speed sensor not mounted correctly. • Missing tooth or teeth on the wheel speed sensor tone-ring. • Electro-magnetic interference (EMI).	Erratic Wheel Speed Sensor ■If the absolute value of the unfiltered wheel acceleration is greater than 491 m/s/s and the wheel or vehicle speed is above 3.58 m/s, an erratic wheel speed sensor may be present. The fault occurrence counter will be incremented by "Fault Maturation Weight". If the fault occurrence counter reaches "Fault Goal", then an erratic wheel speed sensor fault is set. ■If the wheel acceleration is less than or equal to the above threshold, then the fault occurrence counter is decremented by monitor rate. This allows the system to slowly decay the fault occurrence counter so that only a very erratic wheel speed sensor with unrealistic acceleration values will set this fault. ■Counter: 1000 ■Monitor Rate: 5ms ■Fault maturation time (Goal): 200ms	|Wheel_Accel| > 491 m/s^2	• reference_vehicle_velocity > 3.58 m/s • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	Goal: 40000 Continuous failure Time: 200ms	Type A. MIL Illumination.
WSS_ERRATIC_FRONT_RIGHT	C050A	This monitor checks if: • Wheel speed sensor not mounted correctly. • Missing tooth or teeth on the wheel speed sensor tone-ring. • Electro-magnetic interference (EMI).	Erratic Wheel Speed Sensor ■If the absolute value of the unfiltered wheel acceleration is greater than 491 m/s/s and the wheel or vehicle speed is above 3.58 m/s, an erratic wheel speed sensor may be present. The fault occurrence counter will be incremented by "Fault Maturation Weight". If the fault occurrence counter reaches "Fault Goal", then an erratic wheel speed sensor fault is set. ■If the wheel acceleration is less than or equal to the above threshold, then the fault occurrence counter is decremented by monitor rate. This allows the system to slowly decay the fault occurrence counter so that only a very erratic wheel speed sensor with unrealistic acceleration values will set this fault. ■Counter: 1000 ■Monitor Rate: 5ms ■Fault maturation time (Goal): 200ms	|Wheel_Accel| > 491 m/s^2	• reference_vehicle_velocity > 3.58 m/s • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	Goal: 40000 Continuous failure Time: 200ms	Type A. MIL Illumination.
WSS_ERRATIC_REAR_LEFT	C0510	This monitor checks if: • Wheel speed sensor not mounted correctly. • Missing tooth or teeth on the wheel speed sensor tone-ring. • Electro-magnetic interference (EMI).	Erratic Wheel Speed Sensor ■If the absolute value of the unfiltered wheel acceleration is greater than 491 m/s/s and the wheel or vehicle speed is above 3.58 m/s, an erratic wheel speed sensor may be present. The fault occurrence counter will be incremented by "Fault Maturation Weight". If the fault occurrence counter reaches "Fault Goal", then an erratic wheel speed sensor fault is set. ■If the wheel acceleration is less than or equal to the above threshold, then the fault occurrence counter is decremented by monitor rate. This allows the system to slowly decay the fault occurrence counter so that only a very erratic wheel speed sensor with unrealistic acceleration values will set this fault. ■Counter: 1000 ■Monitor Rate: 5ms ■Fault maturation time (Goal): 200ms	|Wheel_Accel| > 491 m/s^2	• reference_vehicle_velocity > 3.58 m/s • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	Goal: 40000 Continuous failure Time: 200ms	Type A. MIL Illumination.
WSS_ERRATIC_REAR_RIGHT	C0516	This monitor checks if: • Wheel speed sensor not mounted correctly. • Missing tooth or teeth on the wheel speed sensor tone-ring. • Electro-magnetic interference (EMI).	Erratic Wheel Speed Sensor ■If the absolute value of the unfiltered wheel acceleration is greater than 491 m/s/s and the wheel or vehicle speed is above 3.58 m/s, an erratic wheel speed sensor may be present. The fault occurrence counter will be incremented by "Fault Maturation Weight". If the fault occurrence counter reaches "Fault Goal", then an erratic wheel speed sensor fault is set. ■If the wheel acceleration is less than or equal to the above threshold, then the fault occurrence counter is decremented by monitor rate. This allows the system to slowly decay the fault occurrence counter so that only a very erratic wheel speed sensor with unrealistic acceleration values will set this fault. ■Counter: 1000 ■Monitor Rate: 5ms ■Fault maturation time (Goal): 200ms	|Wheel_Accel| > 491 m/s^2	• reference_vehicle_velocity > 3.58 m/s • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	Goal: 40000 Continuous failure Time: 200ms	Type A. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_DROPOUT_FRONT_LEFT	C0505	This monitor checks if: • Defective wheel speed sensor. • Wheel speed sensor not mounted correctly. • Defective wheel speed sensor wiring harness. • Missing tooth or teeth on the wheel speed sensor tone-ring.	• Wheel Speed Sensor Dropout • When wheel speed sensor acceleration is detected that is above 392 m/s/s, a timer is initialized to hold off wheel speed sensor dropout detection for 1000 msec. Once this sudden acceleration is detected (and the timer is greater than zero), subsequent accelerations/decelerations greater than 294 m/s/s will reset the timer to the greater of the current timer value or 500 msec. Ibis is done to prevent setting a fault during subsequent performance activity. • Once the timer decays to zero (or is already zero), the wheel speed sensor dropout monitor checks if any wheel speed sensor edges have been detected. If wheel speed sensor edges have been detected then we check if the wheel velocity is greater than 0.2236 m/s. If it is then we can pass this failsafe. If not we reset the fault monitor because we can not monitor this fault condition at this time. • If no wheel speed sensor edges have been detected for more than 150ms while the last valid wheel velocity (which was calculated based on real speed edges) was greater than 30km/h a WSS Dropout fault will be detected. Furthermore the filtered vehicle velocity must be greater than 3.58m/s to detect the fault. • Counter: Count 1-up • Monitor Rate: 7ms	When wheel speed sensor acceleration is detected that is above 392 m/s/s, a timer is initialized to hold off wheel speed sensor dropout detection for 1000 msec. Once this sudden acceleration is detected (and the timer is greater than zero), subsequent accelerations/decelerations greater than 294 m/s/s will reset the timer to the greater of the current timer value or 500 msec. This is done to prevent setting a fault during subsequent performance activity. If no wheel speed sensor edges have been detected then we see which axle the wheel is on because there can be different wheel speed thresholds. We also check if the brake pedal is applied. Wheels can decelerate much faster when the brake pedal is applied than when it is not applied so the brake pedal is used to determine the speed threshold at which the sensor dropout monitor can be executed. If the brake pedal is applied, a higher wheel speed threshold is used than when the brake pedal is not applied. If the brake pedal is applied the wheel speed sensor velocity threshold is 9 m/s for wheels on the front axle and 9 m/s for wheels on the back axle. If the brake pedal is not applied then the wheel speed sensor velocity threshold is 5.38 m/s for wheels on the front axle and 5.38 m/s for wheels on the back axle. If the last valid wheel velocity is greater than the wheel speed velocity threshold set above, the difference in time from the last time we checked for this fault is greater than 40 msec, and the filtered vehicle velocity is above 3.58 m/s then a wheel speed sensor dropout fault is detected. If any of these conditions are not true then conditions are not correct to do dropout detection so reset the fault monitor.	• Wheel speed sensor supply is enabled. • No ohmic wheel speed sensor failure present • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	40 ms	Type B. MIL Illumination.
WSS--DROPOUT--FRONT--RIGHT	C050B	This monitor checks if: • Defective wheel speed sensor. • Wheel speed sensor not mounted correctly. • Defective wheel speed sensor wiring harness. • Missing tooth or teeth on the wheel speed sensor tone-ring.	• Wheel Speed Sensor Dropout • When wheel speed sensor acceleration is detected that is above 392 m/s/s, a timer is initialized to hold off wheel speed sensor dropout detection for 1000 msec. Once this sudden acceleration is detected (and the timer is greater than zero), subsequent acceleration s/decelerations greater than 294 m/s/s will reset the timer to the greater of the current timer value or 500 msec. Ibis is done to prevent setting a fault during subsequent performance activity. • Once the timer decays to zero (or is already zero), the wheel speed sensor dropout monitor checks if any wheel speed sensor edges have been detected. If wheel speed sensor edges have been detected then we check if the wheel velocity is greater than 0.2236 m/s. If it is then we can pass this failsafe. If not we reset the fault monitor because we can not monitor this fault condition at this time. • If no wheel speed sensor edges have been detected for more than 150ms while the last valid wheel velocity (which was calculated based on real speed edges) was greater than 30km/h a WSS Dropout fault will be detected. Furthermore the filtered vehicle velocity must be greater than 3.58m/s to detect the fault. • Counter: Count 1-up • Monitor Rate: 7ms	When wheel speed sensor acceleration is detected that is above 392 m/s/s, a timer is initialized to hold off wheel speed sensor dropout detection for 1000 msec. Once this sudden acceleration is detected (and the timer is greater than zero), subsequent accelerations/decelerations greater than 294 m/s/s will reset the timer to the greater of the current timer value or 500 msec. This is done to prevent setting a fault during subsequent performance activity. If no wheel speed sensor edges have been detected then we see which axle the wheel is on because there can be different wheel speed thresholds. We also check if the brake pedal is applied. Wheels can decelerate much faster when the brake pedal is applied than when it is not applied so the brake pedal is used to determine the speed threshold at which the sensor dropout monitor can be executed. If the brake pedal is applied, a higher wheel speed threshold is used than when the brake pedal is not applied. If the brake pedal is applied the wheel speed sensor velocity threshold is 9 m/s for wheels on the front axle and 9 m/s for wheels on the back axle. If the brake pedal is not applied then the wheel speed sensor velocity threshold is 5.38 m/s for wheels on the front axle and 5.38 m/s for wheels on the back axle. If the last valid wheel velocity is greater than the wheel speed velocity threshold set above, the difference in time from the last time we checked for this fault is greater than 40 msec, and the filtered vehicle velocity is above 3.58 m/s then a wheel speed sensor dropout fault is detected. If any of these conditions are not true then conditions are not correct to do dropout detection so reset the fault monitor.	• Wheel speed sensor supply is enabled. • No ohmic wheel speed sensor failure present • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	40 ms	Type B. MIL Illumination.
WSS_DROPOUT_REAR_LEFT	C0511	This monitor checks if: • Defective wheel speed sensor. • Wheel speed sensor not mounted correctly. • Defective wheel speed sensor wiring harness. • Missing tooth or teeth on the wheel speed sensor tone-ring.	• Wheel Speed Sensor Dropout • When wheel speed sensor acceleration is detected that is above 392 m/s/s, a timer is initialized to hold off wheel speed sensor dropout detection for 1000 msec. Once this sudden acceleration is detected (and the timer is greater than zero), subsequent acceleration s/decelerations greater than 294 m/s/s will reset the timer to the greater of the current timer value or 500 msec. Ibis is done to prevent setting a fault during subsequent performance activity. • Once the timer decays to zero (or is already zero), the wheel speed sensor dropout monitor checks if any wheel speed sensor edges have been detected. If wheel speed sensor edges have been detected then we check if the wheel velocity is greater than 0.2236 m/s. If it is then we can pass this failsafe. If not we reset the fault monitor because we can not monitor this fault condition at this time. • If no wheel speed sensor edges have been detected for more than 150ms while the last valid wheel velocity (which was calculated based on real speed edges) was greater than 30km/h a WSS Dropout fault will be detected. Furthermore the filtered vehicle velocity must be greater than 3.58m/s to detect the fault. • Counter: Count 1-up • Monitor Rate: 7ms	When wheel speed sensor acceleration is detected that is above 392 m/s/s, a timer is initialized to hold off wheel speed sensor dropout detection for 1000 msec. Once this sudden acceleration is detected (and the timer is greater than zero), subsequent accelerations/decelerations greater than 294 m/s/s will reset the timer to the greater of the current timer value or 500 msec. This is done to prevent setting a fault during subsequent performance activity. If no wheel speed sensor edges have been detected then we see which axle the wheel is on because there can be different wheel speed thresholds. We also check if the brake pedal is applied. Wheels can decelerate much faster when the brake pedal is applied than when it is not applied so the brake pedal is used to determine the speed threshold at which the sensor dropout monitor can be executed. If the brake pedal is applied, a higher wheel speed threshold is used than when the brake pedal is not applied. If the brake pedal is applied the wheel speed sensor velocity threshold is 9 m/s for wheels on the front axle and 9 m/s for wheels on the back axle. If the brake pedal is not applied then the wheel speed sensor velocity threshold is 5.38 m/s for wheels on the front axle and 5.38 m/s for wheels on the back axle. If the last valid wheel velocity is greater than the wheel speed velocity threshold set above, the difference in time from the last time we checked for this fault is greater than 40 msec, and the filtered vehicle velocity is above 3.58 m/s then a wheel speed sensor dropout fault is detected. If any of these conditions are not true then conditions are not correct to do dropout detection so reset the fault monitor.	• Wheel speed sensor supply is enabled. • No ohmic wheel speed sensor failure present • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	40 ms	Type B. MIL Illumination.
WSS_DROPOUT_REAR_RIGHT	C0517	This monitor checks if: • Defective wheel speed sensor. • Wheel speed sensor not mounted correctly. • Defective wheel speed sensor wiring harness. • Missing tooth or teeth on the wheel speed sensor tone-ring.	• Wheel Speed Sensor Dropout • When wheel speed sensor acceleration is detected that is above 392 m/s/s, a timer is initialized to hold off wheel speed sensor dropout detection for 1000 msec. Once this sudden acceleration is detected (and the timer is greater than zero), subsequent acceleration s/decelerations greater than 294 m/s/s will reset the timer to the greater of the current timer value or 500 msec. Ibis is done to prevent setting a fault during subsequent performance activity. • Once the timer decays to zero (or is already zero), the wheel speed sensor dropout monitor checks if any wheel speed sensor edges have been detected. If wheel speed sensor edges have been detected then we check if the wheel velocity is greater than 0.2236 m/s. If it is then we can pass this failsafe. If not we reset the fault monitor because we can not monitor this fault condition at this time. • If no wheel speed sensor edges have been detected for more than 150ms while the last valid wheel velocity (which was calculated based on real speed edges) was greater than 30km/h a WSS Dropout fault will be detected. Furthermore the filtered vehicle velocity must be greater than 3.58m/s to detect the fault. • Counter: Count 1-up • Monitor Rate: 7ms	When wheel speed sensor acceleration is detected that is above 392 m/s/s, a timer is initialized to hold off wheel speed sensor dropout detection for 1000 msec. Once this sudden acceleration is detected (and the timer is greater than zero), subsequent accelerations/decelerations greater than 294 m/s/s will reset the timer to the greater of the current timer value or 500 msec. This is done to prevent setting a fault during subsequent performance activity. If no wheel speed sensor edges have been detected then we see which axle the wheel is on because there can be different wheel speed thresholds. We also check if the brake pedal is applied. Wheels can decelerate much faster when the brake pedal is applied than when it is not applied so the brake pedal is used to determine the speed threshold at which the sensor dropout monitor can be executed. If the brake pedal is applied, a higher wheel speed threshold is used than when the brake pedal is not applied. If the brake pedal is applied the wheel speed sensor velocity threshold is 9 m/s for wheels on the front axle and 9 m/s for wheels on the back axle. If the brake pedal is not applied then the wheel speed sensor velocity threshold is 5.38 m/s for wheels on the front axle and 5.38 m/s for wheels on the back axle. If the last valid wheel velocity is greater than the wheel speed velocity threshold set above, the difference in time from the last time we checked for this fault is greater than 40 msec, and the filtered vehicle velocity is above 3.58 m/s then a wheel speed sensor dropout fault is detected. If any of these conditions are not true then conditions are not correct to do dropout detection so reset the fault monitor.	• Wheel speed sensor supply is enabled. • No ohmic wheel speed sensor failure present • Diagnostic Mode Inactive • Emissions Rolls Test Inactive	40 ms	Type B. MIL Illumination.
WSS_FAST_MISSING_FRONT_LEFT	C0505	This monitor checks if: • Wheel speed sensor not mounted correctly. • Wheel speed sensor to tone-ring gap out of tolerance. • Demagnetized tone-ring.	• Fast Missing Wheel Speed Sensor • This failsafe is only active from Ignition On until the vehicle reaches 15km/h for the first time. • During this time the wheel speeds and wheel speed pulses are monitored	Tbe wheel speed monitor starts at velocities above 4km/h. If a wheel speed sensor shows a velocity slower than 1.2km/h the wheel speed is considered to be missing and corresponding internal fault counter of the failsafe will be incremented. At the time the vehicle reaches 15km/h, these fault counters and the wheel speed pulse counters are used to decide whether a fault has to be latched or not. Tbe failsafe will only latch a fault if only one wheel speed signal seems to be missing. If more than one wheel speed signal is missing, no fault will be latched by this failsafe because this is not required to be detected until 15km/h. If a fast missing fault has been detected the failsafe monitors the conditions until either the failure condition disappears for enough time to remove the fault code or the fault can be removed in case it has been confirmed by another wss fault code.	• Wheel speed sensor supply is enabled. • No other wheel speed sensor failure present • 15 km/h not reached this ignition cycle • Diagnostic Mode Inactive • Emissions Rolls Test Inactive SYSTEM_VOLTAGE_EXCESSIVE_LOW not latched	1 count	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_FAST_MISSING_FRONT_RIGHT	C050B	This monitor checks if: • Wheel speed sensor not mounted correctly. • Wheel speed sensor to tone-ring gap out of tolerance. • Demagnetized tone-ring.	• Fast Missing Wheel Speed Sensor • This failsafe is only active from Ignition On until the vehicle reaches 15km/h for the first time. • During this time the wheel speeds and wheel speed pulses are monitored	The wheel speed monitor starts at velocities above 4km/h. If a wheel speed sensor shows a velocity slower than 1.2km/h the wheel speed is considered to be missing and corresponding internal fault counter of the failsafe will be incremented. At the time the vehicle reaches 15km/h, these fault counters and the wheel speed pulse counters are used to decide whether a fault has to be latched or not. The failsafe will only latch a fault if only one wheel speed signal seems to be missing. If more than one wheel speed signal is missing, no fault will be latched by this failsafe because this is not required to be detected until 15km/h. If a fast missing fault has been detected the failsafe monitors the conditions until either the failure condition disappears for enough time to remove the fault code or the fault can be removed in case it has been confirmed by another wss fault code.	• Wheel speed sensor supply is enabled. • No other wheel speed sensor failure present • 15 km/h not reached this ignition cycle • Diagnostic Mode Inactive • Emissions Rolls Test Inactive SYSTEM_VOLTAGE_EXCESSIVE_LOW not latched	1 count	Type B. MIL Illumination.
WSS_FAST_MISSING_REAR_LEFT	C0511	This monitor checks if: • Wheel speed sensor not mounted correctly. • Wheel speed sensor to tone-ring gap out of tolerance. • Demagnetized tone-ring. (should come from FMEA)	• Fast Missing Wheel Speed Sensor • This failsafe is only active from Ignition On until the vehicle reaches 15km/h for the first time. • During this time the wheel speeds and wheel speed pulses are monitored	The wheel speed monitor starts at velocities above 4km/h. If a wheel speed sensor shows a velocity slower than 1.2km/h the wheel speed is considered to be missing and corresponding internal fault counter of the failsafe will be incremented. At the time the vehicle reaches 15km/h, these fault counters and the wheel speed pulse counters are used to decide whether a fault has to be latched or not. The failsafe will only latch a fault if only one wheel speed signal seems to be missing. If more than one wheel speed signal is missing, no fault will be latched by this failsafe because this is not required to be detected until 15km/h. If a fast missing fault has been detected the failsafe monitors the conditions until either the failure condition disappears for enough time to remove the fault code or the fault can be removed in case it has been confirmed by another wss fault code.	• Wheel speed sensor supply is enabled. • No other wheel speed sensor failure present • 15 km/h not reached this ignition cycle • Diagnostic Mode Inactive • Emissions Rolls Test Inactive SYSTEM_VOLTAGE_EXCESSIVE_LOW not latched	1 count	Type B. MIL Illumination.
WSS_FAST_MISSING_REAR_RIGHT	C0517	This monitor checks if: • Wheel speed sensor not mounted correctly. • Wheel speed sensor to tone-ring gap out of tolerance. • Demagnetized tone-ring.	• Fast Missing Wheel Speed Sensor • This failsafe is only active from Ignition On until the vehicle reaches 15km/h for the first time. • During this time the wheel speeds and wheel speed pulses are monitored	The wheel speed monitor starts at velocities above 4km/h. If a wheel speed sensor shows a velocity slower than 1.2km/h the wheel speed is considered to be missing and corresponding internal fault counter of the failsafe will be incremented. At the time the vehicle reaches 15km/h, these fault counters and the wheel speed pulse counters are used to decide whether a fault has to be latched or not. The failsafe will only latch a fault if only one wheel speed signal seems to be missing. If more than one wheel speed signal is missing, no fault will be latched by this failsafe because this is not required to be detected until 15km/h. If a fast missing fault has been detected the failsafe monitors the conditions until either the failure condition disappears for enough time to remove the fault code or the fault can be removed in case it has been confirmed by another wss fault code.	• Wheel speed sensor supply is enabled. • No other wheel speed sensor failure present • 15 km/h not reached this ignition cycle • Diagnostic Mode Inactive • Emissions Rolls Test Inactive SYSTEM_VOLTAGE_EXCESSIVE_LOW not latched	1 count	Type B. MIL Illumination.
WSS_TOO_FAST_SENSOR_FRONT_LEFT	C0505	This monitor checks if: - Wheel speed sensor not mounted correctly. - Wheel speed sensor to tone-ring gap out of tolerance. - Demagnitized tone-ring	If this wheelspeed sensor reaches a speed over3.73mph (6 km/h) while the other three show a speed of less than 0.93mph (1.5 km/h) the fault is detected.	If fault detection criteria is fulfilled then WSS_TOO_FAST_SENSOR_XX will latch if WSS--MISSING--XX or WSS_FAST_MISSING_XX or WSS_DROPOUT_XX faults are not latched.	• No electrical failure is currently present	40 msec	Type B. MIL Illumination.
WSS_TOO_FAST_SENSOR_FRONT_RIGHT	C050B	This monitor checks if: - Wheel speed sensor not mounted correctly. - Wheel speed sensor to tone-ring gap out of tolerance. - Demagnitized tone-ring	If this wheelspeed sensor reaches a speed over3.73mph (6 km/h) while the other three show a speed of less than 0.93mph (1.5 km/h) the fault is detected.	If fault detection criteria is fulfilled then WSS_TOO_FAST_SENSOR_XX will latch if WSS--MISSING--XX or WSS_FAST_MISSING_XX or WSS_DROPOUT_XX faults are not latched.	• No electrical failure is currently present	40 msec	Type B. MIL Illumination.
WSS_TOO_FAST_SENSOR_REAR_LEFT	C0511	This monitor checks if: - Wheel speed sensor not mounted correctly. - Wheel speed sensor to tone-ring gap out of tolerance. - Demagnitized tone-ring	If this wheelspeed sensor reaches a speed over3.73mph (6 km/h) while the other three show a speed of less than 0.93mph (1.5 km/h) the fault is detected.	If fault detection criteria is fulfilled then WSS_TOO_FAST_SENSOR_XX will latch if WSS--MISSING--XX or WSS_FAST_MISSING_XX or WSS_DROPOUT_XX faults are not latched.	• No electrical failure is currently present	40 msec	Type B. MIL Illumination.
WSS_TOO_FAST_SENSOR_REAR_RIGHT	C0517	This monitor checks if: - Wheel speed sensor not mounted correctly. - Wheel speed sensor to tone-ring gap out of tolerance. - Demagnitized tone-ring	If this wheelspeed sensor reaches a speed over3.73mph (6 km/h) while the other three show a speed of less than 0.93mph (1.5 km/h) the fault is detected.	If fault detection criteria is fulfilled then WSS_TOO_FAST_SENSOR_XX will latch if WSS--MISSING--XX or WSS_FAST_MISSING_XX or WSS_DROPOUT_XX faults are not latched.	• No electrical failure is currently present	40 msec	Type B. MIL Illumination.
WSS_SHADOWZONE_FRONT_LEFT	C0501	This monitor checks if: •High resistance of wiring harness • High side wheel speed sensor supply shorted to battery voltage with a resistance (leakage current)	• Detection is handled by the Polaris ASIC	Polaris ASIC Low Grey Zone Detect bit = True (Tie low grey zone is 7 to 14mA) or Polaris ASIC High Grey Zone Detect bit = True (Tie high grey zone is 14 to 28mA)	• No electrical failure is currently present	100 ms	Type A MIL Illumination.
WSS_SHADOWZONE_FRONT_RIGHT	C0507	This monitor checks if: •High resistance of wiring harness • High side wheel speed sensor supply shorted to battery voltage with a resistance (leakage current)	• Detection is handled by the Polaris ASIC	Polaris ASIC Low Grey Zone Detect bit = True (Tie low grey zone is 7 to 14mA) or Polaris ASIC High Grey Zone Detect bit = True (Tie high grey zone is 14 to 28mA)	• No electrical failure is currently present	100 ms	Type A MIL Illumination.
WSS_SHADOWZONE_REAR_LEFT	C050D	This monitor checks if: •High resistance of wiring harness • High side wheel speed sensor supply shorted to battery voltage with a resistance (leakage current)	• Detection is handled by the Polaris ASIC	Polaris ASIC Low Grey Zone Detect bit = True (Tie low grey zone is 7 to 14mA) or Polaris ASIC High Grey Zone Detect bit = True (Tie high grey zone is 14 to 28mA)	• No electrical failure is currently present	100 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_SHADOWZONE_REAR_RIGHT	C0513	This monitor checks if: •High resistance of wiring harness • High side wheel speed sensor supply shorted to battery voltage with a resistance (leakage current)	• Detection is handled by the Polaris ASIC	Polaris ASIC Low Grey Zone Detect bit = True (Tie low grey zone is 7 to 14mA) or Polaris ASIC High Grey Zone Detect bit = True (Tie high grey zone is 14 to 28mA)	• No electrical failure is currently present	100 ms	Type A MIL Illumination.
WSS_HS_OC_FRONT_LEFT	C0503	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC sets any of these bits = TRUE	Polaris ASIC sets HS Over Current = TRUE High Side Over Current (HS current > 40mA)	• Wheel speed sensor supply is enabled. • High Side failsafe is not blocked	100 msec	Type A MIL Illumination.
WSS_HS_OC_FRONT_RIGHT	C0509	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC sets any of these bits = TRUE	Polaris ASIC sets any of these bits = TRUE High Side Over Current (HS current > 40mA)	• Wheel speed sensor supply is enabled. • High Side failsafe is not blocked	100 msec	Type A MIL Illumination.
WSS_HS_OC_REAR_LEFT	C050F	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC sets any of these bits = TRUE	Polaris ASIC sets any of these bits = TRUE High Side Over Current (HS current > 40mA)	• Wheel speed sensor supply is enabled. • High Side failsafe is not blocked	100 msec	Type A MIL Illumination.
WSS_HS_OC_REAR_RIGHT	C0515	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC sets any of these bits = TRUE	Polaris ASIC sets any of these bits = TRUE High Side Over Current (HS current > 40mA)	• Wheel speed sensor supply is enabled. • High Side failsafe is not blocked	100 msec	Type A MIL Illumination.
WSS_UNDER_VOLTAGE_FRONT_LEFT	P0562	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board	• Detection is handled by the Polaris ASIC	Polaris ASIC sets WSS Undervoltage disable bit = TRUE Note: This bit will activate when Battery voltage drops below 5.6 V	• Wheel speed sensor supply is enabled • No voltage DTCs are set	100 msec	Type B. MIL Illumination.
WSS_UNDER_VOLTAGE_FRONT_RIGHT	P0562	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board	• Detection is handled by the Polaris ASIC	Polaris ASIC sets WSS Undervoltage disable bit = TRUE Note: This bit will activate when Battery voltage drops below 5.6 V	• Wheel speed sensor supply is enabled • No voltage DTCs are set	100 msec	Type B. MIL Illumination.
WSS_UNDER_VOLTAGE_REAR_LEFT	P0562	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Detection is handled by the Polaris ASIC	Polaris ASIC sets WSS Undervoltage disable bit = TRUE Note: This bit will activate when Battery voltage drops below 5.6 V	• Wheel speed sensor supply is enabled • No voltage DTCs are set	100 msec	Type B. MIL Illumination.
WSS_UNDER_VOLTAGE_REAR_RIGHT	P0562	This monitor checks if: • Defective wheel speed sensor • Defective wire harness to wheel speed sensor • Defective printed circuit board • Defective Polaris ASIC	• Detection is handled by the Polaris ASIC	Polaris ASIC sets WSS Undervoltage disable bit = TRUE Note: This bit will activate when Battery voltage drops below 5.6 V	• Wheel speed sensor supply is enabled • No voltage DTCs are set	100 msec	Type B. MIL Illumination.
ASIC_DECODE_THREE_LEVEL_FAULT_LF	C0555	This monitor checks if: •wrong vehicle config file used • misbuild using wrong WSS	Look for ASIC decoding a three level sensor when a two level sensor is configured: Check for the number of VDA bits received indicates that the ASIC is decoding for a three level sensor or Check for the tp out of range bit received indicates that the ASIC is decoding for a three level sensor	While a wheelspeed channel is expected to be configured for a2-level sensor (i.e. decode modes 1 or 2), the MCU shall monitor the tp Out of Range and VDA Bit Counter SPI bits. If these bits are not zero, the MCU shall detect that the ASIC is incorrectly decoding in mode 3.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_THREE_LEVEL_DATA_READ_FAULT_LF	C0501	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	• When the ASIC updates the VDA Data, VDA Bit Counter, Standstill, and tp Out of Range SPI fields, the ASIC shall also set the Data Read SPI flag.	The MCU shall monitor each wheel's Data Read SPI flag, and verify that the bit is set at least every 195ms.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_TWO_LEVEL_DATA_READ_FAULT_LF	P0606	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	• When the ASIC updates the PWM Pulse Width and Standstill SPI register fields, the ASIC shall also set the Data Read SPI flag.	The MCU shall monitor each wheel's Data Read SPI flag, and verify that the bit is set after every sensor falling edge.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_DECODE_THREE_LEVEL_FAULT_RF	C0556	This monitor checks if: •wrong vehicle config file used • misbuild using wrong WSS	Look for ASIC decoding a three level sensor when a two level sensor is configured: Check for the number of VDA bits received indicates that the ASIC is decoding for a three level sensor or Check for the tp out of range bit received indicates that the ASIC is decoding for a three level sensor	While a wheelspeed channel is expected to be configured for a2-level sensor (i.e. decode modes 1 or 2), the MCU shall monitor the tp Out of Range and VDA Bit Counter SPI bits. If these bits are not zero, the MCU shall detect that the ASIC is incorrectly decoding in mode 3.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_THREE_LEVEL_DATA_READ_FAULT RF	C0507	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	• When the ASIC updates the VDA Data, VDA Bit Counter, Standstill, and tp Out of Range SPI fields, the ASIC shall also set the Data Read SPI flag.	The MCU shall monitor each wheel's Data Read SPI flag, and verify that the bit is set at least every 195ms.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_TWO_LEVEL_DATA_READ_FAULT_RF	P0606	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	• When the ASIC updates the PWM Pulse Width and Standstill SPI register fields, the ASIC shall also set the Data Read SPI flag.	The MCU shall monitor each wheel's Data Read SPI flag, and verify that the bit is set after every sensor falling edge.	• Polaris is initialized	15 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
ASIC_DECODE_THREE_LEVEL_FAULT_LR	C0557	This monitor checks if: • wrong vehicle config file used • misbuild using wrong WSS	Look for ASIC decoding a three level sensor when a two level sensor is configured: Check for the number of VDA bits received indicates that the ASIC is decoding for a three level sensor or Check for the tp out of range bit received indicates that the ASIC is decoding for a three level sensor	While a wheelspeed channel is expected to be configured for a2-level sensor (i.e. decode modes 1 or 2), the MCL) shall monitor the tp Out of Range and VDA Bit Counter SPI bits. If these bits are not zero, the MCU shall detect that the ASIC is incorrectly decoding in mode 3.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_THREE_LE VEL_DATA_READ_FAU LT_LR	C050D	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	• When the ASIC updates the VDA Data, VDA Bit Counter, Standstill, and tp Out of Range SPI fields, the ASIC shall also set the Data Read SPI flag.	The MCU shall monitor each wheel's Data Read SPI flag, and verify that the bit is set at least every 195ms.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_7WO_LEVEL_DATA_READ_FAULT_LR	P0606	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	• When the ASIC updates the PWM Pulse Width and Standstill SPI register fields, the ASIC shall also set the Data Read SPI flag.	The MCU shall monitor each wheel's Data Read SPI flag, and verify that the bit is set after every sensor falling edge.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_DECODE_THREE_LEVEL_FAULT_RR	C0558	This monitor checks if: • wrong vehicle config file used • misbuild using wrong WSS	Look for ASIC decoding a three level sensor when a two level sensor is configured: Check for the number of VDA bits received indicates that the ASIC is decoding for a three level sensor or Check for the tp out of range bit received indicates that the ASIC is decoding for a three level sensor	While a wheelspeed channel is expected to be configured for a2-level sensor (i.e. decode modes 1 or 2), the MCU shall monitor the tp Out of Range and VDA Bit Counter SPI bits. If these bits are not zero, the MCU shall detect that the ASIC is incorrectly decoding in mode 3.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_THREE_LE VEL_DATA_READ_FAU LT_RR	C0513	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	• When the ASIC updates the VDA Data, VDA Bit Counter, Standstill, and tp Out of Range SPI fields, the ASIC shall also set the Data Read SPI flag.	The MCU shall monitor each wheel's Data Read SPI flag, and verify that the bit is set at least every 195ms.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ASIC_7WO_LEVEL_DATA_READ_FAULT_RR	P0606	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	• When the ASIC updates the PWM Pulse Width and Standstill SPI register fields, the ASIC shall also set the Data Read SPI flag.	The MCU shall monitor each wheel's Data Read SPI flag, and verify that the bit is set after every sensor falling edge.	• Polaris is initialized	15 msec	Type A MIL Illumination.
WSS_3L_INFO_MISSING_FRONT_LEFT	C0555	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	Monitors if an intelligent 3-level wss doesn't send pulses (standstill or wheel speed pulses) for too long.	Monitors if an intelligent 3-level wss doesn't send pulses (standstill or wheel speed pulses) for too long. Furthermore it checks the number of received data bits in the transmission. If less than the minimum number of data bits (3) are received, a fault will be latched.	• Polaris is initialized. •Wheel Speed Sensor supply is enabled • No WSS electrical fault is present • SYSTEM_VOLTAGE_EXCESSIVE_LOW fault is not present	250 msec	Type A MIL Illumination.
WSS_3L_INFO_MISSING_FRONT_RIGHT	C0556	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	Monitors if an intelligent 3-level wss doesn't send pulses (standstill or wheel speed pulses) for too long.	Monitors if an intelligent 3-level wss doesn't send pulses (standstill or wheel speed pulses) for too long. Furthermore it checks the number of received data bits in the transmission. If less than the minimum number of data bits (3) are received, a fault will be latched.	• Polaris is initialized. •Wheel Speed Sensor supply is enabled • No WSS electrical fault is present • SYSTEM_VOLTAGE_EXCESSIVE_LOW fault is not present	250 msec	Type A MIL Illumination.
WSS_3L_INFO_MISSING_REAR_LEFT	C0557	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	Monitors if an intelligent 3-level wss doesn't send pulses (standstill or wheel speed pulses) for too long.	Monitors if an intelligent 3-level wss doesn't send pulses (standstill or wheel speed pulses) for too long. Furthermore it checks the number of received data bits in the transmission. If less than the minimum number of data bits (3) are received, a fault will be latched.	• Polaris is initialized. •Wheel Speed Sensor supply is enabled • No WSS electrical fault is present • SYSTEM_VOLTAGE_EXCESSIVE_LOW fault is not present	250 msec	Type A MIL Illumination.
WSS_3L_INFO_MISSING_REAR_RIGHT	C0558	This monitor checks if: • Defective system ASIC ASIC data read flag is not updated properly	Monitors if an intelligent 3-level wss doesn't send pulses (standstill or wheel speed pulses) for too long.	Monitors if an intelligent 3-level wss doesn't send pulses (standstill or wheel speed pulses) for too long. Furthermore it checks the number of received data bits in the transmission. If less than the minimum number of data bits (3) are received, a fault will be latched.	• Polaris is initialized. •Wheel Speed Sensor supply is enabled • No WSS electrical fault is present • SYSTEM_VOLTAGE_EXCESSIVE_LOW fault is not present	250 msec	Type A MIL Illumination.
WSS_PARITY_FRONT_LEFT	C0555	This monitor checks if: VDA data bits are corrupted	Decodes the additional information of a Philips KMI22/1 wheelspeed sensor which is a 3-level VDA compliant sensor.	It's a VDA compliant Philips KMI22/1 sensor so use the following mask for the data bits: 0 airgap (1=too large) 1 mode state (1=initial mode, 0=active mode) 2 digital input state (1=input voltage low) 3 validity direction recognition (1=direction bit is valid) 4 direction recognition (1=direction positive (forward driving)) 5-7 sensing distance bits (air gap) (Bit 5 is LSB, 7 MSB) (8) parity (1=even parity) The even parity flag should be the same as the calculated even parity. Else, it indicates that atleast one data bit is corrupted.	• Polaris is initialized. •Wheel Speed Sensor supply is enabled	35 msec	Type A MIL Illumination.
WSS_PARITY_FRONT_RIGHT	C0556	This monitor checks if: VDA data bits are corrupted	Decodes the additional information of a Philips KMI22/1 wheelspeed sensor which is a 3-level VDA compliant sensor.	It's a VDA compliant Philips KMI22/1 sensor so use the following mask for the data bits: 0 airgap (1=too large) 1 mode state (1=initial mode, 0=active mode) 2 digital input state (1=input voltage low) 3 validity direction recognition (1=direction bit is valid) 4 direction recognition (1=direction positive (forward driving)) 5-7 sensing distance bits (air gap) (Bit 5 is LSB, 7 MSB) (8) parity (1=even parity) The even parity flag should be the same as the calculated even parity. Else, it indicates that atleast one data bit is corrupted.	• Polaris is initialized. •Wheel Speed Sensor supply is enabled	35 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_PARITY_REAR_LEFT	C0557	This monitor checks if: VDA data bits are corrupted	Decodes the additional information of a Philips KMI22/1 wheelspeed sensor which is a 3-level VDA compliant sensor.	It's a VDA compliant Philips KMI22/1 sensor so use the following mask for the data bits: 0 airgap (1=too large) 1 mode state (1=initial mode, 0=active mode) 2 digital input state (1=input voltage low) 3 validity direction recognition (1=direction bit is valid) 4 direction recognition (1=direction positive (forward driving)) 5-7 sensing distance bits (air gap) (Bit 5 is LSB, 7 MSB) (8) parity (1=even parity) The even parity flag should be the same as the calculated even parity. Else, it indicates that atleast one data bit is corrupted.	• Polaris is initialized. •Wheel Speed Sensor supply is enabled	35 msec	Type A MIL Illumination.
WSS_PARITY_REAR_RIG HT	C0558	This monitor checks if: VDA data bits are corrupted	Decodes the additional information of a Philips KMI22/1 wheelspeed sensor which is a 3-level VDA compliant sensor.	It's a VDA compliant Philips KMI22/1 sensor so use the following mask for the data bits: 0 airgap (1=too large) 1 mode state (1=initial mode, 0=active mode) 2 digital input state (1=input voltage low) 3 validity direction recognition (1=direction bit is valid) 4 direction recognition (1=direction positive (forward driving)) 5-7 sensing distance bits (air gap) (Bit 5 is LSB, 7 MSB) (8) parity (1=even parity) The even parity flag should be the same as the calculated even parity. Else, it indicates that atleast one data bit is corrupted.	• Polaris is initialized. •Wheel Speed Sensor supply is enabled	35 msec	Type A MIL Illumination.
WSS_VDA_TP_OUT_OF_RANGE_FRONT_LEFT	C0501	This monitor checks if: • standstill pulse width out of range • Defective system ASIC	• The ASIC shall measure the width of each speed pulse or speed replacement pulse (tp). If tp is less than tp minimum threshold or greater than tp maximum threshold, the ASIC shall set the tp Out of Range SPI flag.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse width is out of range (error bit equals 1) (3 level WSS only)	• Polaris is initialized • Wheel speed edge or stand still pulse received	15 msec -375ms	Type A MIL Illumination.
WSS_VDA_TP_OUT_OF_RANG E_FRONT_RIG HT	C0507	This monitor checks if: • standstill pulse width out of range • Defective system ASIC	• The ASIC shall measure the width of each speed pulse or speed replacement pulse (tp). If tp is less than tp minimum threshold or greater than tp maximum threshold, the ASIC shall set the tp Out of Range SPI flag.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse width is out of range (error bit equals 1) (3 level WSS only)	• Polaris is initialized • Wheel speed edge or stand still pulse received	15 msec -375ms	Type A MIL Illumination.
WSS_VDA_TP_OUT_OF_RANGE_REAR_LEFT	C050D	This monitor checks if: • standstill pulse width out of range • Defective system ASIC	• The ASIC shall measure the width of each speed pulse or speed replacement pulse (tp). If tp is less than tp minimum threshold or greater than tp maximum threshold, the ASIC shall set the tp Out of Range SPI flag.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse width is out of range (error bit equals 1) (3 level WSS only)	• Polaris is initialized • Wheel speed edge or stand still pulse received	15 msec -375ms	Type A MIL Illumination.
WSS_VDA_TP_OUT_OF_RANG E_REAR_RIGHT	C0513	This monitor checks if: • standstill pulse width out of range • Defective system ASIC	• The ASIC shall measure the width of each speed pulse or speed replacement pulse (tp). If tp is less than tp minimum threshold or greater than tp maximum threshold, the ASIC shall set the tp Out of Range SPI flag.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse width is out of range (error bit equals 1) (3 level WSS only)	• Polaris is initialized • Wheel speed edge or stand still pulse received	15 msec -375ms	Type A MIL Illumination.
WSS_STANDSTILL_FAST_FRONT_LEFT	C0501	This monitor checks if: • Defective system ASIC Standstill VDA transmission too short	• The MCU shall detect if standstill pulses occur faster than every 95ms, for 5 consecutive standstill pulses.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse transmission is too short - less than 105 msec (3 level WSS only)	• Polaris is initialized	Variable. See Fault Equation and detection rules. Range is from 25 - 475ms.	Type A MIL Illumination.
WSS_STANDSTILL_SLOW_FRONT_LEFT	C0501	This monitor checks if: • Defective system ASIC • Standstill VDA transmission too long	• The MCU shall detect if standstill pulses occur slower than every 205ms, or no standstill pulse at all for 1025ms.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse transmission is too long - more than 195 msec (3 level WSS only)	• Polaris is initialized	Variable. See Fault Equation and Detection Rules. Range is from 1025 - 5100ms.	Type A MIL Illumination.
WSS_STANDSTILL_FAST_FRONT_RIGHT	C0507	This monitor checks if: • Defective system ASIC Standstill VDA transmission too short	• The MCU shall detect if standstill pulses occur faster than every 95ms, for 5 consecutive standstill pulses.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse transmission is too short - less than 105 msec (3 level WSS only)	• Polaris is initialized	Variable. See Fault Equation and detection rules. Range is from 25 - 475ms.	Type A MIL Illumination.
WSS_STANDSTILL_SLOW_FRO NT_RIG HT	C0507	This monitor checks if: • Defective system ASIC • Standstill VDA transmission too long	• The MCU shall detect if standstill pulses occur slower than every 205ms, or no standstill pulse at all for 1025ms.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse transmission is too long - more than 195 msec (3 level WSS only)	• Polaris is initialized	Variable. See Fault Equation and Detection Rules. Range is from 1025 - 5100ms.	Type A MIL Illumination.
WSS_STANDSTILL_FAST_REAR_LEFT	C050D	This monitor checks if: • Defective system ASIC Standstill VDA transmission too short	• The MCU shall detect if standstill pulses occur faster than every 95ms, for 5 consecutive standstill pulses.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse transmission is too short - less than 105 msec (3 level WSS only)	• Polaris is initialized	Variable. See Fault Equation and detection rules. Range is from 25 - 475ms.	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_STANDSTILL_SLOW_REAR_LEFT	C050D	This monitor checks if: • Defective system ASIC • Standstill VDA transmission too long	• The MCU shall detect if standstill pulses occur slower than every 205ms, or no standstill pulse at all for 1025ms.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse transmission is too long - more than 195 msec (3 level WSS only)	• Polaris is initialized	Variable. See Fault Equation and Detection Rules. Range is from 1025 - 5100ms.	Type A MIL Illumination.
WSS_STANDSTILL_FAST_REAR_RIGHT	C0513	This monitor checks if: • Defective system ASIC Standstill VDA transmission too short	• The MCU shall detect if standstill pulses occur faster than every 95ms, for 5 consecutive standstill pulses.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse transmission is too short - less than 105 msec (3 level WSS only)	• Polaris is initialized	Variable. See Fault Equation and detection rules. Range is from 25 - 475ms.	Type A MIL Illumination.
WSS_STANDSTILL_SLOW_REAR_RIGHT	C0513	This monitor checks if: • Defective system ASIC • Standstill VDA transmission too long	• The MCU shall detect if standstill pulses occur slower than every 205ms, or no standstill pulse at all for 1025ms.	POLARIS ASIC sends diagnostic information indicating that the standstill pulse transmission is too long - more than 195 msec (3 level WSS only)	• Polaris is initialized	Variable. See Fault Equation and Detection Rules. Range is from 1025 - 5100ms.	Type A MIL Illumination.
SYS_ASIC_WSS_EDGE_MISMATCH_LF	P0606	This monitor checks if: • ASIC outputs shorted to neighbouring pins • Open trace on circuit board. • Defective system ASIC	The Wheel Speed signal generated by the ASIC and the one received by the main Micro should match to insure correct wheel speed calculation.	1) The micro monitors the number of edges received every loop for plausability (less than a max number). 2) The micro will compare the edges detected by the internal timer with the SPI flags sent by the ASIC to make sure they match.	• Polaris is initialized • No other ASIC faults detected	25 msec	Type A MIL Illumination.
SYS_ASIC_WSS_EDGE_MISMATCH_RF	P0606	This monitor checks if: • ASIC outputs shorted to neighbouring pins • Open trace on circuit board. • Defective system ASIC	The Wheel Speed signal generated by the ASIC and the one received by the main Micro should match to insure correct wheel speed calculation.	1) The micro monitors the number of edges received every loop for plausability (less than a max number). 2) The micro will compare the edges detected by the internal timer with the SPI flags sent by the ASIC to make sure they match.	• Polaris is initialized • No other ASIC faults detected	25 msec	Type A MIL Illumination.
SYS_ASIC_WSS_EDGE_MISMATCH_LR	P0606	This monitor checks if: • ASIC outputs shorted to neighbouring pins • Open trace on circuit board. • Defective system ASIC	The Wheel Speed signal generated by the ASIC and the one received by the main Micro should match to insure correct wheel speed calculation.	1) The micro monitors the number of edges received every loop for plausability (less than a max number). 2) The micro will compare the edges detected by the internal timer with the SPI flags sent by the ASIC to make sure they match.	• Polaris is initialized • No other ASIC faults detected	25 msec	Type A MIL Illumination.
SYS_ASIC_WSS_EDGE_MISMATCH_RR	P0606	This monitor checks if: • ASIC outputs shorted to neighbouring pins • Open trace on circuit board. • Defective system ASIC	The Wheel Speed signal generated by the ASIC and the one received by the main Micro should match to insure correct wheel speed calculation.	1) The micro monitors the number of edges received every loop for plausability (less than a max number). 2) The micro will compare the edges detected by the internal timer with the SPI flags sent by the ASIC to make sure they match.	• Polaris is initialized • No other ASIC faults detected	25 msec	Type A MIL Illumination.
MCU_WSS_EXCESSIVE_EDGES_DETECTED_FRONT_LEFT	C0504	This monitor checks if: • Defective system ASIC • Defective wheel speed sensor	This fault is latched when the edge counts exceeds the threshold.	Excessive Edge counts > 55	•Wheel speed sensor supply is enabled	25 msec	Type A MIL Illumination.
MCU_WSS_EXCESSIVE_EDGES_DETECTED_FRONT_RIGHT	C050A	This monitor checks if: • Defective system ASIC • Defective wheel speed sensor	This fault is latched when the edge counts exceeds the threshold.	Excessive Edge counts > 55	•Wheel speed sensor supply is enabled	25 msec	Type A MIL Illumination.
MCU_WSS_EXCESSIVE_EDGES_DETECTED_REAR_LEFT	C0510	This monitor checks if: • Defective system ASIC • Defective wheel speed sensor	This fault is latched when the edge counts exceeds the threshold.	Excessive Edge counts > 55	•Wheel speed sensor supply is enabled	25 msec	Type A MIL Illumination.
MCU_WSS_EXCESSIVE_EDGES_DETECTED_REAR_RIGHT	C0516	This monitor checks if: • Defective system ASIC • Defective wheel speed sensor	This fault is latched when the edge counts exceeds the threshold.	Excessive Edge counts > 55	•Wheel speed sensor supply is enabled	25 msec	Type A MIL Illumination.
WSS_TYPE_MISMATCH_FRONT_LEFT	C0555	This monitor checks if: • Incorrect WSS installed (Non-Directional or Infineon sensor)	• Probability counters are used to determine the likelihood of possible DWSS sensors. Therefore, no speed or time filtering is needed. Detection time depends on wheel speed. When the vehicle is at a stop, detection time is longest since no direction is transmitted (both sensor types look the same) and standstill pulses are used instead. At high-speeds, detection is shortest since missing or extra direction information will indicate the sensor installed. Looking for 30 speed pulses that match a particular wheel speed sensor type. Time depends on combination of expected wheel speed sensor and actual wheel speed sensor. Nominal calculations: Expecting 2 level nonIntelligent but have 3 level WSS (30*150 ms=4.5 sec). 2 level directional stand still pulses take 737 ms and for each puse the probablity counter increments by 3. Therefore it takes about ((30/3)*737 ms= 7.37 seconds) to detect.	Algorithm has detected that a directional WSS has incorrectly been installed	• WSS must be valid (supply enabled and no electrical problems)	Goal = 1 count Time = Depends on combination (about 4.5 sec if 3 level sensor installed and about 7.37 secs if 2 level with standstill sensor is installed for 2 level non intelligent sensor expected.	Type A MIL Illumination.
WSS_TYPE_MISMATCH_FRONT_RIGHT	C0556	This monitor checks if: • Incorrect WSS installed (Non-Directional or Infineon sensor)	• Probability counters are used to determine the likelihood of possible DWSS sensors. Therefore, no speed or time filtering is needed. Detection time depends on wheel speed. When the vehicle is at a stop, detection time is longest since no direction is transmitted (both sensor types look the same) and standstill pulses are used instead. At high-speeds, detection is shortest since missing or extra direction information will indicate the sensor installed. Looking for 30 speed pulses that match a particular wheel speed sensor type. Time depends on combination of expected wheel speed sensor and actual wheel speed sensor. Nominal calculations: Expecting 2 level nonIntelligent but have 3 level WSS (30*150 ms=4.5 sec). 2 level directional stand still pulses take 737 ms and for each puse the probablity counter increments by 3. Therefore it takes about ((30/3)*737 ms= 7.37 seconds) to detect.	Algorithm has detected that a directional WSS has incorrectly been installed	• WSS must be valid (supply enabled and no electrical problems)	Goal = 1 count Time = Depends on combination (about 4.5 sec if 3 level sensor installed and about 7.37 secs if 2 level with standstill sensor is installed for 2 level non intelligent sensor expected.	Type A MIL Illumination.
WSS_TYPE_MISMATCH_REAR_LEFT	C0557	This monitor checks if: • Incorrect WSS installed (Non-Directional or Infineon sensor)	• Probability counters are used to determine the likelihood of possible DWSS sensors. Therefore, no speed or time filtering is needed. Detection time depends on wheel speed. When the vehicle is at a stop, detection time is longest since no direction is transmitted (both sensor types look the same) and standstill pulses are used instead. At high-speeds, detection is shortest since missing or extra direction information will indicate the sensor installed. Looking for 30 speed pulses that match a particular wheel speed sensor type. Time depends on combination of expected wheel speed sensor and actual wheel speed sensor. Nominal calculations: Expecting 2 level nonIntelligent but have 3 level WSS (30*150 ms=4.5 sec). 2 level directional stand still pulses take 737 ms and for each puse the probablity counter increments by 3. Therefore it takes about ((30/3)*737 ms= 7.37 seconds) to detect.	Algorithm has detected that a directional WSS has incorrectly been installed	• WSS must be valid (supply enabled and no electrical problems)	Goal = 1 count Time = Depends on combination (about 4.5 sec if 3 level sensor installed and about 7.37 secs if 2 level with standstill sensor is installed for 2 level non intelligent sensor expected.	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_TYPE_MISMATCH_REAR_RIGHT	C0558	This monitor checks if: • Incorrect WSS installed (Non-Directional or Infineon sensor)	• Probability counters are used to determine the likelihood of possible DWSS sensors. Therefore, no speed or time filtering is needed. Detection time depends on wheel speed. When the vehicle is at a stop, detection time is longest since no direction is transmitted (both sensor types look the same) and standstill pulses are used instead. At high-speeds, detection is shortest since missing or extra direction information will indicate the sensor installed. Looking for 30 speed pulses that match a particular wheel speed sensor type. Time depends on combination of expected wheel speed sensor and actual wheel speed sensor. Nominal calculations: Expecting 2 level nonintelligent but have 3 level WSS (30*150 ms=4.5 sec). 2 level directional stand still pulses take 737 ms and for each puse the probability counter increments by 3. Therefore it takes about ((30\3)*737 ms= 7.37 seconds) to detect.	Algorithm has detected that a directional WSS has incorrectly been installed	• WSS must be valid (supply enabled and no electrical problems)	Goal = 1 count Time = Depends on combination (about 4.5 sec if 3 level sensor installed and about 7.37 secs if 2 level with standstill sensor is installed for 2 level non intelligent sensor expected.	Type A MIL Illumination.
SYS_ASIC_U_WS_OVER_VOLT	C05A3	This monitor checks if: • Defective system ASIC	If VU_WS exceeds the rising U_WS over-voltage detection threshold for the detection debounce time, the ASIC sets the U_WS Overvoltage Warning SPI flag and disable the four high-side switches.	The MCU shall configure the wheelspeed sensor overvoltage bypass configuration to LOW. If the WSS overvoltage warning bit is set, fault is set.	• Polaris is initialized	50 msec	Type A MIL Illumination.
SYS_ASIC_WSS_SUPPLY_LOW	P0562	This monitor checks if: • Defective system ASIC	• Within the ASIC, the U_WS and U12 voltages shall be internally divided down and shall feed dedicated ADC channels.	The MCU shall read the ASIC's U_WS Voltage Result SPI field and verify that "sufficient voltage" is present for wheelspeed operation. For ECUs with no U_WS voltage regulation: the MCU shall also read the ASIC's U12 Voltage Result SPI field and perform a plausibility check between U_WS and U12. Note: sufficient voltage for wheelspeed operation depends upon the type of wheelspeed sensor used.	• Polaris is initialized	100 msec	Type B. MIL Illumination.
WSS_OVER_TEMP_WARNING	P0606	This monitor checks if: • Defective system ASIC • internal overheating	• MCU shall monitor the U_WS OverTemp Warning SPI flag received from the ASIC	MCU detects that the U_WS OverTemp Warning SPI flag received from the ASIC is TRUE	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_WSS_HS_STUCK_ON	C05A3	This monitor checks if: • Defective system ASIC	• The ASIC's open circuit detection (SM42) shall remain operational even if the channel's high-side supply is turned off or disabled. • Periodically (e.g. once per ignition cycle), the MCU shall enable the low-side wheelspeed supplies but shall leave the high-side supplies off. The MCU shall detect if an open-circuit is not detected on any channel. • Periodically (e.g. once per ignition cycle), the MCU shall command the wheelspeed high-side supplies off, low-side supplies on, and verify that each channel's Open Circuit SPI bit is set.	Any one wheel fails to detect an open-circuit during either the high-side or low-side supply ON check.	• Polaris is initialized	15 msec	Type A MIL Illumination.
MISMATCH_TIRE	C10EE	This monitor checks if: • Significantly different size tires installed on the vehicle. • Missing target ring (sensor picking up lug nuts) •Anything that generates consistent differences in apparent wheel rotational speed. • Different number of teeth on the exciter rings.	• Wheel Velocity Differences between one and the others > 15 %. • The mismatch tire ratio adjustment is disabled if: • Vehicle Velocity < 8.9 mph, • Cornering is detected, • Spinning wheels are detected, • Braking is detected, • Wheel speed sensor faults exist. • Counter: Count 1-up • Monitor Rate: 10ms	Wheel Velocity difference between one and the others > 15 %	• The mismatch tire ratio adjustment is disabled if: • Vehicle Velocity < 8.9 mph, • Cornering is detected, • Spinning wheels are detected, • Braking is detected, • Wheel speed sensor faults exist, • Emissions Rolls Test is active	1 Count	Type B. MIL Illumination.
WSS--DIRECTION. FAILURE--FRONT_LEFT	C0056	This monitor checks if: • Wheel speed sensor not mounted correctly. • Electro-magnetic interference (EMI).	• Number of valid directional and non-directional WSS sensors must be greater than 0. • Number of valid directional WSS sensors must be greater than 0. •Valid directional and non-directional WSS sensors must: • Show unfiltered wheel-speed velocity >= 15 km/h. • Show unfiltered wheel-speed acceleration < 50 m/s^2. •All valid directional and non-directional WSS sensors must show velocities within 15% of the slowest valid wheel.	At least 1 sensor indicates Unknown, or at least 1 sensor indicates Forward and at least one sensor indicates Backwards For duration > 5 seconds While vehicle speed > 15 km/h.	• WSS must be valid (supply enabled and no electrical problems)	5 seconds	Type B. MIL Illumination.
WSS--DIRECTION. FAILURE--FRONT_RIGHT	C0057	This monitor checks if: • Wheel speed sensor not mounted correctly. • Electro-magnetic interference (EMI).	• Number of valid directional and non-directional WSS sensors must be greater than 0. • Number of valid directional WSS sensors must be greater than 0. •Valid directional and non-directional WSS sensors must: • Show unfiltered wheel-speed velocity >= 15 km/h. • Show unfiltered wheel-speed acceleration < 50 m/s^2. •All valid directional and non-directional WSS sensors must show velocities within 15% of the slowest valid wheel.	At least 1 sensor indicates Unknown, or at least 1 sensor indicates Forward and at least one sensor indicates Backwards For duration > 5 seconds While vehicle speed > 15 km/h.	• WSS must be valid (supply enabled and no electrical problems)	5 seconds	Type B. MIL Illumination.
WSS_DIRECTION_FAILURE_REAR_LEFT	C0058	This monitor checks if: • Wheel speed sensor not mounted correctly. • Electro-magnetic interference (EMI).	• Number of valid directional and non-directional WSS sensors must be greater than 0. • Number of valid directional WSS sensors must be greater than 0. •Valid directional and non-directional WSS sensors must: • Show unfiltered wheel-speed velocity >= 15 km/h. • Show unfiltered wheel-speed acceleration < 50 m/s^2. •All valid directional and non-directional WSS sensors must show velocities within 15% of the slowest valid wheel.	At least 1 sensor indicates Unknown, or at least 1 sensor indicates Forward and at least one sensor indicates Backwards For duration > 5 seconds While vehicle speed > 15 km/h.	• WSS must be valid (supply enabled and no electrical problems)	5 seconds	Type B. MIL Illumination.
WSS_DIRECTION_FAILURE_REAR_RIGHT	C0059	This monitor checks if: • Wheel speed sensor not mounted correctly. • Electro-magnetic interference (EMI).	• Number of valid directional and non-directional WSS sensors must be greater than 0. • Number of valid directional WSS sensors must be greater than 0. •Valid directional and non-directional WSS sensors must: • Show unfiltered wheel-speed velocity >= 15 km/h. • Show unfiltered wheel-speed acceleration < 50 m/s^2. •All valid directional and non-directional WSS sensors must show velocities within 15% of the slowest valid wheel.	At least 1 sensor indicates Unknown, or at least 1 sensor indicates Forward and at least one sensor indicates Backwards For duration > 5 seconds While vehicle speed > 15 km/h.	• WSS must be valid (supply enabled and no electrical problems)	5 seconds	Type B. MIL Illumination.
WSS--DIRECTION. FAILURE--UNKNOWN	C003F	This monitor checks if: • Wheel speed sensor not mounted correctly. Electro-magnetic interference (EMI).	• Number of valid directional and non-directional WSS sensors must be greater than 0. • Number of valid directional WSS sensors must be greater than 0. •Valid directional and non-directional WSS sensors must: • Show unfiltered wheel-speed velocity >= 15 km/h. • Show unfiltered wheel-speed acceleration < 50 m/s^2. •All valid directional and non-directional WSS sensors must show velocities within 15% of the slowest valid wheel.	When an equal number of sensors report opposite directions, this DTC is latched and all DWSS sensors are marked Failed. num_dwss_forward_dir == num_dwss_reverse_dir	• WSS must be valid (supply enabled and no electrical problems)	5 seconds	Type B. MIL Illumination.
WSS_SUPPLY_SWITCH_FAIL_FRONT_LEFT	C0505	This monitor checks if: internal ECU fault	The Wheel Speed Sensor Supply HS and LS driver request state, that is sent from the system ASIC Polaris via SPI is compared with Wheel Speed Sensor Supply HS and LS driver response state that is received by the system ASIC Polaris via SPI. A fault is set, if the request and response does not fit together.	WSS_SUPPLY(HS/LS)Driver Request != WSS_SUPPLY(HS/LS)Driver Response	- WSS supply is not in excessive under- or overvoltage.	100 ms	Type B. MIL Illumination.
WSS_SUPPLY_SWITCH_FAIL_FRONT_RIGHT	C050B	This monitor checks if: internal ECU fault	The Wheel Speed Sensor Supply HS and LS driver request state, that is sent from the system ASIC Polaris via SPI is compared with Wheel Speed Sensor Supply HS and LS driver response state that is received by the system ASIC Polaris via SPI. A fault is set, if the request and response does not fit together.	WSS_SUPPLY(HS/LS)Driver Request != WSS_SUPPLY(HS/LS)Driver Response	- WSS supply is not in excessive under- or overvoltage.	100 ms	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
WSS_SUPPLY_SWITCH_FAIL_REAR_LEFT	C0511	This monitor checks if: internal ECU fault	The Wheel Speed Sensor Supply HS and LS driver request state, that is sent from the system ASIC Polaris via SPI is compared with Wheel Speed Sensor Supply HS and LS driver response state that is received by the system ASIC Polaris via SPI. A fault is set, if the request and response does not fit together.	WSS_SUPPLY(HS/LS)Driver Request != WSS_SUPPLY(HS/LS)Driver Response	- WSS supply is not in excessive under- or overvoltage.	100 ms	Type B. MIL Illumination.
WSS_SUPPLY_SWITCH_FAIL_REAR_RIGHT	C0517	This monitor checks if: internal ECU fault	The Wheel Speed Sensor Supply HS and LS driver request state, that is sent from the system ASIC Polaris via SPI is compared with Wheel Speed Sensor Supply HS and LS driver response state that is received by the system ASIC Polaris via SPI. A fault is set, if the request and response does not fit together.	WSS_SUPPLY(HS/LS)Driver Request != WSS_SUPPLY(HS/LS)Driver Response	- WSS supply is not in excessive under- or overvoltage.	100 ms	Type B. MIL Illumination.
Group 3 - Solenoid and Valve							
SOL_OPEN_ISO_FRONT_LEFT	C0010	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_ISO_FRONT_RIGHT	C0014	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On and not faulted 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_ISO_REAR_LEFT	C0018	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_ISO_REAR_RIGHT	C001C	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_DUMP_FRONT_LEFT	C0011	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_DUMP_FRONT_RIGHT	C0015	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_DUMP_REAR_LEFT	C0019	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_DUMP_REAR_RIGHT	C001D	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_FDBK_UNEQUAL_TO_CMD_3WAY_PRIMARY	C0001	This monitor checks if: • Deviation in PWM output status • Defective microprocessor. • Defective printed circuit board. • Defective solenoid. • Defective solenoid driver FET.	Whenever the power switch is closed and the driver FET is not turned on (solenoid commanded off) then the feedback voltage should be high. If the solenoid feedback voltage is measured to be > 43.49% and < 65.23% of the coil supply voltage for 30 msec, an open solenoid fault is indicated	For too short on time = Ontime - 7.5% period For too long on time = Ontime + 7.5% period	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	60 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SOL_FDBK_STUCK_HIGH_OR_LOW_3WAY_PRIMARY	C0001	This monitor checks if: • Deviation in PWM output status • Defective microprocessor. • Defective printed circuit board. • Defective solenoid. • Defective solenoid driver FET.	Whenever the power switch is closed and the driver FET is not turned on (solenoid commanded off) then the feedback voltage should be high. If the solenoid feedback voltage is measured to be > 43.49% and < 65.23% of the coil supply voltage for 30 msec, an open solenoid fault is indicated	For too short on time = Ontime - 7.5% period For too long on time = Ontime + 7.5% period	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	60 ms	Type A MIL Illumination.
SOL_FDBK_UNEQUAL_TO_CMD_3WAY_SECONDARY	C0003	This monitor checks if: • Deviation in PWM output status • Defective microprocessor. • Defective printed circuit board. • Defective solenoid. • Defective solenoid driver FET.	Whenever the power switch is closed and the driver FET is not turned on (solenoid commanded off) then the feedback voltage should be high. If the solenoid feedback voltage is measured to be > 43.49% and < 65.23% of the coil supply voltage for 30 msec, an open solenoid fault is indicated.	For too short on time = Ontime - 7.5% period For too long on time = Ontime + 7.5% period	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	60 ms	Type A MIL Illumination.
SOL_FDBK_STUCK_HIGH_OR_LOW_3WAY_SECONDARY	C0003	This monitor checks if: • Deviation in PWM output status • Defective microprocessor. • Defective printed circuit board. • Defective solenoid. • Defective solenoid driver FET.	Whenever the power switch is closed and the driver FET is not turned on (solenoid commanded off) then the feedback voltage should be high. If the solenoid feedback voltage is measured to be > 43.49% and < 65.23% of the coil supply voltage for 30 msec, an open solenoid fault is indicated.	For too short on time = Ontime - 7.5% period For too long on time = Ontime + 7.5% period	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	60 ms	Type A MIL Illumination.
SOL_OPEN_NORMAL_CLOSE_DAP	C0004	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_SIM_NORMAL_CLOSE	C0004	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_NORMAL_OPEN_DAP	C0002	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_OPEN_SIM_TEST	C05D5	This monitor checks if: • Defective solenoid. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Leaky FET Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	After the driver is commanded on, the ASIC shall wait the open driver mask time, and then observe the filtered drain comparator feedback. If the drain feedback is high, the ASIC shall set the DRDx Open Driver Warning SPI bit. Drain comparator threshold: min value = 2.375 V max value = 2.625 V	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_ISO_FRONT_LEFT	C0010	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver • Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_ISO_FRONT_RIGHT	C0014	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver • Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_ISO_REAR_LEFT	C0018	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver • Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_ISO_REAR_RIGHT	C001C	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver • Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
DRIVER_SHORT_DUMP_FRONT_LEFT	C0011	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver • Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_DUMP_FRONT_RIGHT	C0015	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver • Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_DUMP_REAR_LEFT	C0019	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver • Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_DUMP_REAR_RIGHT	C001D	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver • Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_NORMAL_CLOSE_DAP	C0004	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_SIM_NORMAL_CLOSE	C0004	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_NORMAL_OPEN_DAP	C0002	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
DRIVER_SHORT_SIM_TEST	C05D5	This monitor checks if: • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• Shorted Solenoid Driver Vehicle battery voltage is applied to the high side of the solenoid coils in the ECU assembly by the power switch. The solenoids are energized using a field effect transistor (FET) to connect the low side of the coil to ground.	Solenoid_feedback ? 43%	1. Solenoid is commanded off for 20 msec 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	30 ms	Type A MIL Illumination.
SOL_SHORT_ISO_FRONT_LEFT	C0010	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage high when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_ISO_FRONT_RIGHT	C0014	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage high when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_ISO_REAR_LEFT	C0018	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage high when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SOL_SHORT_ISO_REAR_RIGHT	C001C	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage high when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_DUMP_FRONT_LEFT	C0018	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage high when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_DUMP_FRONT_RIGHT	C0015	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage high when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_DUMP_REAR_LEFT	C0019	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage high when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_DUMP_REAR_RIGHT	C001D	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage high when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. • The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_NORMAL_CLOSE_DAP	C0004	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_SIM_NORMAL_CLOSE	C0004	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_NORMAL_OPEN_DAP	C0002	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. • Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_SHORT_SIM_TEST	C05D5	This monitor checks if: • Solenoid coils shorted internally. • Solenoid shorted to a voltage supply or ground. • Defective solenoid driver FET. • Defective printed circuit board. • Defective microprocessor. •Anything that keeps solenoid feedback voltage low when the solenoid is not energized.	• The ASIC shall detect an open driver condition or a shorted coil condition on the external driver FETs by monitoring the drain voltage while the driver is commanded on. The ASIC shall generate a filtered drain comparator feedback signal by comparing the DRDx pin voltage to the drain comparator threshold, and by then filtering the result for the drain comparator feedback debounce time.	The MCU can make the distinction between open driver and shorted coil by performing a coil test pulse on the faulted channel with all other coil channels off. Drain comparator threshold: • min value = 2.375 V • max value = 2.625 V	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	15 ms	Type A MIL Illumination.
SOL_OVERTEMP_ISO_FRONT_LEFT	C0010	This monitor checks if: • Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_ISO_FRONT_RIGHT	C0014	This monitor checks if: • Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SOL_OVERTEMP_ISO_REAR_LEFT	C0018	This monitor checks if: • Anything that causes the solenoid to be active for excessive (usually unintended) period of time		Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_ISO_REAR_RIGHT	C001C	This monitor checks if: • Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_DUMP_FRONT_LEFT	C0011	This monitor checks if: • Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_DUMP_FRONT_RIGHT	C0015	This monitor checks if: • Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL-OVERTE MP_DUMP_REAR_LEFT	C0019	This monitor checks if: • Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_DUMP_REAR_RIGHT	C001D	This monitor checks if: • Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_3WAY_PRIMARY	C0001	This monitor checks if: Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_3WAY-SECON DARY	C0003	This monitor checks if: Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_NORMAL_CLOSE_DAP	C0004	This monitor checks if: Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_SIM_NORMAL_CLOSE	C0004	This monitor checks if: Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_NORMAL_OPEN_DAP	C0002	This monitor checks if: Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.
SOL_OVERTEMP_SIM_TEST	C05D5	This monitor checks if: Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Solenoid Over Temperature • At power up the solenoids are set to the maximum of the ambient temperature as reported by the Polaris ASIC or the solenoid temperature reading stored in NVRAM from the last ignition cycle.	Solenoid_Temperature > 265 °C	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	1 s	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SOL_DRIVER_OVERTEMP_ISO_FRONT_LEFT	C0010	This monitor checks if: • Anything that causes the solenoid driver to be active for excessive (usually unintended) period of time	• Driver Overtemp info transmitted via SPI from Polaris ASIC	Polaris ASIC sends diagnostic information that the driver used to control the coil has exceeded the maximum alloted temperature. Microprocessor recieves the information via SPI from the ASIC	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	5 msec	Type A MIL Illumination.
SOL_DRIVER_OVERTEMP_ISO_FRONT_RIGHT	C0014	This monitor checks if: • Anything that causes the solenoid driver to be active for excessive (usually unintended) period of time	• Driver Overtemp info transmitted via SPI from Polaris ASIC	Polaris ASIC sends diagnostic information that the driver used to control the coil has exceeded the maximum alloted temperature. Microprocessor recieves the information via SPI from the ASIC	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	5 msec	Type A MIL Illumination.
SOL_DRIVER_OVERTEMP_ISO_REAR_LEFT	C0018	This monitor checks if: • Anything that causes the solenoid driver to be active for excessive (usually unintended) period of time	• Driver Overtemp info transmitted via SPI from Polaris ASIC	Polaris ASIC sends diagnostic information that the driver used to control the coil has exceeded the maximum alloted temperature. Microprocessor recieves the information via SPI from the ASIC	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	5 msec	Type A MIL Illumination.
SOL_DRIVER_OVERTEMP_ISO_REAR_RIGHT	C001C	This monitor checks if: • Anything that causes the solenoid driver to be active for excessive (usually unintended) period of time	• Driver Overtemp info transmitted via SPI from Polaris ASIC	Polaris ASIC sends diagnostic information that the driver used to control the coil has exceeded the maximum alloted temperature. Microprocessor recieves the information via SPI from the ASIC	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	5 msec	Type A MIL Illumination.
SOL_DRIVER_OVERTEMP_NORMAL_OPEN_DAP	C0002	This monitor checks if: Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Driver Overtemp info transmitted via SPI from Polaris ASIC	Polaris ASIC sends diagnostic information that the driver used to control the coil has exceeded the maximum alloted temperature. Microprocessor recieves the information via SPI from the ASIC	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	5 msec	Type A MIL Illumination.
SOL_DRIVER_OVERTEMP_SIM_TEST	C0002	This monitor checks if: Anything that causes the solenoid to be active for excessive (usually unintended) period of time	• Driver Overtemp info transmitted via SPI from Polaris ASIC	Polaris ASIC sends diagnostic information that the driver used to control the coil has exceeded the maximum alloted temperature. Microprocessor recieves the information via SPI from the ASIC	1. Solenoid is commanded On 2. Power Switch is On 3. (EXCESSIVE_LOW_SYSTEM_VOLTAGE) 7.5 V < Supply Voltage < 18 V (EXCESSIVE_HIGH_SYSTEM_VOLTAGE)	5 msec	Type A MIL Illumination.
CLAMP_ACTIVATION_FAILURE_ISO_FRONT_LEFT	C0010	This monitor checks if: • Defective / Missing Flyback Diode • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC monitors the solenoid back EMF. If it is above +40V then the Polaris triggers a Clamping Response. If this occurs on two consecutive shut-offs then the Clamp Activation bit is set and the coil output is shut off. Microprocessor receives the information via SPI from the ASIC	Microprocessor receives the information via SPI from the ASIC every 5 msec. If the Clamp Activation bit is set then the bit and coil output are reset to allow another test run until the Clamp Activation Fault has matured.	1. Solenoid is commanded On 2. Power Switch is On 3. Battery voltage is within operating range.	45 counts	Type A MIL Illumination.
CLAMP_ACTIVATION_FAILURE_ISO_FRONT_RIGHT	C0014	This monitor checks if: • Defective/ Missing Flyback Diode • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC monitors the solenoid back EMF. If it is above +40V then the Polaris triggers a Clamping Response. If this occurs on two consecutive shut-offs then the Clamp Activation bit is set and the coil output is shut off. Microprocessor receives the information via SPI from the ASIC	Microprocessor receives the information via SPI from the ASIC every 5 msec. If the Clamp Activation bit is set then the bit and coil output are reset to allow another test run until the Clamp Activation Fault has matured.	1. Solenoid is commanded On 2. Power Switch is On 3. Battery voltage is within operating range.	45 counts	Type A MIL Illumination.
CLAMP_ACTIVATION_FAILURE_ISO_REAR_LEFT	C0018	This monitor checks if: • Defective/ Missing Flyback Diode • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC monitors the solenoid back EMF. If it is above +40V then the Polaris triggers a Clamping Response. If this occurs on two consecutive shut-offs then the Clamp Activation bit is set and the coil output is shut off. Microprocessor receives the information via SPI from the ASIC	Microprocessor receives the information via SPI from the ASIC every 5 msec. If the Clamp Activation bit is set then the bit and coil output are reset to allow another test run until the Clamp Activation Fault has matured.	1. Solenoid is commanded On 2. Power Switch is On 3. Battery voltage is within operating range.	45 counts	Type A MIL Illumination.
CLAMP_ACTIVATION_FAILURE_ISO_REAR_RIGHT	C001C	This monitor checks if: • Defective / Missing Flyback Diode • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC monitors the solenoid back EMF. If it is above +40V then the Polaris triggers a Clamping Response. If this occurs on two consecutive shut-offs then the Clamp Activation bit is set and the coil output is shut off. Microprocessor receives the information via SPI from the ASIC	Microprocessor receives the information via SPI from the ASIC every 5 msec. If the Clamp Activation bit is set then the bit and coil output are reset to allow another test run until the Clamp Activation Fault has matured.	1. Solenoid is commanded On 2. Power Switch is On 3. Battery voltage is within operating range.	45 counts	Type A MIL Illumination.
CLAMP_ACTIVATION_FAILURE_NORMAL_OPEN_DAP	C0002	This monitor checks if: • Defective / Missing Flyback Diode • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC monitors the solenoid back EMF. If it is above +40V then the Polaris triggers a Clamping Response. If this occurs on two consecutive shut-offs then the Clamp Activation bit is set and the coil output is shut off. Microprocessor receives the information via SPI from the ASIC	Microprocessor receives the information via SPI from the ASIC every 5 msec. If the Clamp Activation bit is set then the bit and coil output are reset to allow another test run until the Clamp Activation Fault has matured.	1. Solenoid is commanded On 2. Power Switch is On 3. Battery voltage is within operating range.	45 counts	Type A MIL Illumination.
CLAMP_ACTIVATION_FAILURE_SIM_TEST	C0002	This monitor checks if: • Defective / Missing Flyback Diode • Defective printed circuit board • Defective Polaris ASIC	Polaris ASIC monitors the solenoid back EMF. If it is above +40V then the Polaris triggers a Clamping Response. If this occurs on two consecutive shut-offs then the Clamp Activation bit is set and the coil output is shut off. Microprocessor receives the information via SPI from the ASIC	Microprocessor receives the information via SPI from the ASIC every 5 msec. If the Clamp Activation bit is set then the bit and coil output are reset to allow another test run until the Clamp Activation Fault has matured.	1. Solenoid is commanded On 2. Power Switch is On 3. Battery voltage is within operating range.	45 counts	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
LEAKY_DRIVER_UNKNOWN_ABS_CIRCUITS	C0024	This monitor checks if: • Defective FET • Defective printed circuit board	• Slip Control Power Switch must be commanded ON than subsequently commanded OFF	If the 8 or more coil supply voltages decreased at a rate that is faster than expected, fault will be set.	• Power Switch is ON, then OFF • will only be retested after a power cycle	8 Count	Type A MIL Illumination.
LEAKY_DRIVER_UNKNOWN_BOOST_CIRCUITS	C0024	This monitor checks if: • Defective FET • Defective printed circuit board	• Slip Control Power Switch must be commanded ON than subsequently commanded OFF	If the 8 or more coil supply voltages decreased at a rate that is faster than expected, fault will be set.	• Power Switch is ON, then OFF • will only be retested after a power cycle	8 Count	Type A MIL Illumination.
SOLJDCJDC_SATURATED_HIGHJSO-FRO NT_RIGHT	C0014	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	• Polaris is initialized. • Command is less than 720 mA. • Self-test complete. • Excessive Low Voltage fault not maturing.	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_LOW_ISO_FRONT_RIGHT	C0014	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	Polaris is initialized	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_HIGH_ISO_FRONT_LEFT	C0010	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	• Polaris is initialized. • Command is less than 720 mA. • Self-test complete. • Excessive Low Voltage fault not maturing.	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_LOW_ISO_FRONT_LEFT	C0010	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	Polaris is initialized	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_HIGH_ISO_REAR_RIGHT	C001C	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	• Polaris is initialized. • Command is less than 720 mA. • Self-test complete. • Excessive Low Voltage fault not maturing.	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_LOW_ISO_REAR_RIGHT	C001C	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	Polaris is initialized	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_HIGH_ISO_REAR_LEFT	C0018	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	• Polaris is initialized. • Command is less than 720 mA. • Self-test complete. • Excessive Low Voltage fault not maturing.	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_LOW_ISO_REAR_LEFT	C0018	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	Polaris is initialized	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_HIGH_NORMALO PEN_DAP	C0002	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	• Polaris is initialized. • Command is less than 720 mA. • Self-test complete. • Excessive Low Voltage fault not maturing.	100 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SOL_CC_DC_SATURATED_LOW_NORMAL_OPEN_DAP	C0002	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	Polaris is initialized	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_HIGH_SIM_TEST	C0002	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	• Polaris is initialized. • Command is less than 720 mA. • Self-test complete. • Excessive Low Voltage fault not maturing.	100 ms	Type A MIL Illumination.
SOL_CC_DC_SATURATED_LOW_SIM_TEST	C0002	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	If a closed loop current control loop is broken, or if the target current is not physically achievable due to external limitations (e.g. coil resistance or supply voltage) or due the minimum on-time, the control loop's integrator shall cause the duty cycle command to saturate high or low. The time to reach saturation depends upon the tuning of the controller coefficients and the current feedback error.	Duty cycle is out of range	Polaris is initialized	100 ms	Type A MIL Illumination.
SOL_OVER_VOLTAGE_NORMAL_CLOSE_DAP	00004	This monitor checks if: Defective/Missing Suppression diode Defective PCB	Polaris ASIC monitors the DRDx (driver) pin voltage. If the DRDx pin voltage exceeds 40V for longer than the DRDx overvoltage debounce time, the ASIC shall set the DRDx Overvoltage Warning SPI bit. Microprocessor receives the information via SPI from the ASIC	Microprocessor receives the information via SPI from the ASIC every 5 msec. If the DRDx Overvoltage Warning SPI bit is set then the DRDx Overvoltage fault is set.	1. Solenoid is commanded On 2. Power Switch is On 3. Battery voltage is within operating range.	7 counts	Type A MIL Illumination.
SOL_OVER_VOLTAGE_SIM_NORMAL_CLOSE	C0004	This monitor checks if: Defective/Missing Suppression diode Defective PCB	Polaris ASIC monitors the DRDx (driver) pin voltage. If the DRDx pin voltage exceeds 40V for longer than the DRDx overvoltage debounce time, the ASIC shall set the DRDx Overvoltage Warning SPI bit. Microprocessor receives the information via SPI from the ASIC	Microprocessor receives the information via SPI from the ASIC every 5 msec. If the DRDx Overvoltage Warning SPI bit is set then the DRDx Overvoltage fault is set.	1. Solenoid is commanded On 2. Power Switch is On 3. Battery voltage is within operating range.	7 counts	Type A MIL Illumination.
DC_SOL_REGULATION_FAILURE	P0606	This monitor checks if: • Defective system ASIC	• The ASIC shall monitor the state of each DROx output and report if it does not match the commanded state.	The MCU shall monitor ASIC's "DROx Gate Monitor Fault" SPI bits.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SOL_DUTY_CYCLE_FDBK_PUXUS_CC_DR1	P0606	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 20%	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 10%	• Polaris is initialized	15 msec	Type A MIL Illumination.
SOL_DUTY_CYCLE_FDBK_PUXUS_CC_DR2	P0606	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 20%	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 10%	• Polaris is initialized	15 msec	Type A MIL Illumination.
SOL_DUTY_CYCLE_FDBK_PLAUS_CC_DR3	P0606	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 20%	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 10%	• Polaris is initialized	15 msec	Type A MIL Illumination.
SOL_DUTY_CYCLE_FDBK_PLAUS_CC_DR4	P0606	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 20%	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 10%	• Polaris is initialized	15 msec	Type A MIL Illumination.
SOL_DUTY_CYCLE_FDBK_PLAUS_CC_DR5	P0606	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 20%	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 10%	• Polaris is initialized	15 msec	Type A MIL Illumination.
SOL_DUTY_CYCLE_FDBK_PLAUS_CC_DR6	P0606	This monitor checks if: • Problem writing coil temperature to NVRAM (Controlled_SHUTDOWN_FAILURE (loss of battery), SPI failure, NVRAM failure etc) • Problem reading Engine OFF time, used to estimate temperature cooling (Missing message, corrupted message, CAN failure etc)	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 20%	The MCU shall monitor battery voltage and maintain an estimated coil temperature/resistance model. For a given current command, the MCU shall estimate the required duty cycle. The MCU shall verify that the estimated duty cycle against the ASIC's reported "CC_DRx Duty Cycle Command Feedback" match within a TBD tolerance. Current threshold is 10%	• Polaris is initialized	15 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SOL_DRIVER_CURRENT_PLAUS_CC_DR1	P0606	This monitor checks if: • Defective system ASIC ASIC cannot control sol current properly	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	• Polaris is initialized • Coil Commanded in Duty Cycle mode	50 msec	Type A MIL Illumination.
SOL_DRIVER_CURRENT_PLAUS_CC_DR2	P0606	This monitor checks if: • Defective system ASIC ASIC cannot control sol current properly	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	• Polaris is initialized • Coil Commanded in Duty Cycle mode	50 msec	Type A MIL Illumination.
SOL_DRIVER_CURRENT_PLAUS_CC_DR3	P0606	This monitor checks if: • Defective system ASIC ASIC cannot control sol current properly	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	• Polaris is initialized • Coil Commanded in Duty Cycle mode	50 msec	Type A MIL Illumination.
SOL_DRIVER_CURRENT_PLAUS_CC_DR4	P0606	This monitor checks if: • Defective system ASIC ASIC cannot control sol current properly	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	• Polaris is initialized • Coil Commanded in Duty Cycle mode	50 msec	Type A MIL Illumination.
SOL_DRIVER_CURRENT_PLAUS_CC_DR5	P0606	This monitor checks if: • Defective system ASIC ASIC cannot control sol current properly	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	• Polaris is initialized • Coil Commanded in Duty Cycle mode	50 msec	Type A MIL Illumination.
SOL_DRIVER_CURRENT_PLAUS_CC_DR6	P0606	This monitor checks if: • Defective system ASIC ASIC cannot control sol current properly	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	For CC_DRx channels in duty-cycle control mode: While a CC_DRx coil drive is commanded to greater than 0% duty cycle, the MCU shall monitor the ASIC's CC_DRx Current Result SPI field and verity the result matches the expected current. When a duty cycle command results in an CC_DRx on-time less than the minimum on time, no coil current measurement is possible. The reported CC_DRx Current Result will retain its prior value, and the corresponding Data Read bit will be 0. SW shall suspend SM102 while Data Read is 0.	• Polaris is initialized • Coil Commanded in Duty Cycle mode	50 msec	Type A MIL Illumination.
Group 4 - Electronic Control Unit (ECU)							
SPI_FAILURE_ASIC	P0606	This monitor checks if: • Defective printed circuit board. • Defective Polaris ASIC. • Defective microprocessor. • Noisy Power	• This fault can be set by problems communicating over SPI between the MICRO and the Polaris ASIC. It is checked ONCE at power up. • The SPI initialization will fail if the driver has not finished a previous transmission when a new transmission is required (not enough SPI throughput). • The SPI initialization will also fail if the driver detects an error (bad parity, control register data echo over the SPI or control register data read does not match). • If the Polaris ASIC fails to initialize SPI communication after 2 retries (3 attempts total) then this fault is set • Counter: Count 1-up • Monitor Rate: 1ms	Polaris Error Flag = TRUE Polaris.Error_Flags != 0 Polaris.Error_Flags_Observed != Polaris.Error_Flags	• Power Switch is ON	3 ms	Type A MIL Illumination.
NVRAM_WRITE_FAILURE	P062F	This monitor checks if: •Communication problem with NVRAM chip • NVRAM hardware problem • PCB problem	• This fault is detected by the NVRAM handler. The NVRAM handler verifies a successful write event by reading back the information that is expected to be stored in NVRAM and also verifying the checksum.	If the NVRAM handler detects an unsuccessful write event three times, the fault is set.	• Power Switch in ON	60 msec	Type A MIL Illumination.
COIL_DRIVER_SPI_FAILURE	P0606	This monitor checks if: • Defective system ASIC	• After a rising SYNC pin edge has occurred, the SW shall read the ASIC's "SYNC Armed Status" flag and detects if the bit is still high (indicating the rising SYNC pin edge was not detected).	The ASIC clears the "SYNC Armed" bit after a rising edge has occurred on the SYNC pin. The ASIC provides the "SYNC Armed Status" SPI flag, which reflects the state of the "SYNC Armed" SPI bit. After a rising SYNC pin edge has occurred, the SW reads the ASIC's "SYNC Armed Status" SPI bit and detects if the bit is still high (indicating the rising SYNC pin edge was not detected).	• Polaris is initialized	15 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
EXT_WATCHDOG_FAIL	P0606	This monitor checks if: • Defective system ASIC	• None.	Periodically (e.g. once per ignition cycle), the MCU shall perform the following watchdog test (or equivalent): (1) Start with the Watchdog Counter Value SPI field = 0, the WDEN pin high, and all other "watchdog-enabled functions" otherwise enabled. (2) Verify Watchdog Status SPI bit is 0 and all "watchdog-enabled functions" are disabled. (3) Service watchdog until the Watchdog Counter Value = 6. Verify the conditions from (2) remain. (4) Set the WDEN pin low, then service the watchdog. (5) Confirm the Watchdog Counter Value = 7 and all "watchdog-enabled functions" are disabled. (6) Allow the watchdog to timeout, then set the WDEN pin high. (7) Confirm the Watchdog Counter Value = 0, Watchdog Status bit is 0, and all "watchdog-enabled functions" are disabled. Watchdog-enable functions are: (1) solid state relay driver pin (VDG), (2) the motor 14bridge pre-driver pins (PDG and PRG), (3) the ENQ digital output pin, and (4) the low-side coil drivers (CC_DRx) and pre-drivers (DROx).	• Polaris is initialized	10 msec	Type A MIL Illumination.
AD_PERIPHERAL_TIMEOUT_FAILURE	P060B	This monitor checks if: • Defective printed circuit board. • Defective Polaris ASIC. • Defective microprocessor.	• A/D Peripheral Timeout Failure • When reading an A/D channel, the software enters a "wait" loop where it looks for a bit in an A/D register to be set, indicating that the conversion is complete. A "timeout" mechanism exists that breaks out of the wait loop after 100 usec (well longer than it is ever expected to complete an A/D conversion) has elapsed. If this timeout mechanism is executed, a fault code is set. • Counter: Count 1-up • Monitor Rate: 10ms	Adc Port Lockup Detected = TRUE	• Power Switch is ON	5ms	Type A MIL Illumination.
AD_EVENT_LOCKUP	P060B	This monitor checks if: • Defective printed circuit board. • Defective Polaris ASIC. • Defective microprocessor.	A/D Event Lockup Failure Two detection methods: No A/D conversions in the last 5 msec: A counter is incremented when A/D conversion results are retrieved. Every 5 msec this counter is checked. If it is 0, then the AD_EVENT_LOCKUP fault will begin to mature. If greater than 0, then it is cleared. 2 consecutive failures are needed to set the fault. Adc_Synchronization_Failed flag is TRUE: The ASIC will set this flag TRUE when the conversion count (number of channels converted) is larger than what is expected (9). 2 consecutive failures are needed to set the fault.	Adc Lockup Count = 0 or Adc Synchronization Failed = TRUE	• Power Switch is ON	5ms	Type A MIL Illumination.
SOLENOID-PERIODIC-INTERRUPT-FAILURE	P0606	This monitor checks if: • Defective microprocessor. Incorrect microprocessor application code, ex. Bad scheduler	HET Periodic Interrupt Failure Verifies that one particular High End Timer interrupt (HET) feedback; occurs every pass through the schedule loop time (10MS). This fault is set if no HET interrupt feedback has occurred for 3 consequentive schedule loop time (10MS). The HET interrupt feedback that is checked is the solenoid feedback interrupts, This Solenoid feedback interrupt is scheduled every interval of the operating system. The fault is cleared when above condition does not exist. Counter: Count 1-up-Reset Monitor Rate: 10MS	periodic het interrupt flag = FALSE (periodic interrupt did not occur)	Power Switch is ON	5ms	Type A MIL Illumination.
SYS_ASIC_U3_SELECT_FAILURE	P0606	This monitor checks if: Defective system ASIC Missing external U3 FET when external U3 FET is expected (less current delivered with internal FET) Existing U3 FET when U3 FET is not expected (Note: No system reaction required)	If the external U3 FET is present, the ASIC shall set the U3 External FET SPI bit, if not present it will clear the bit. Software sets fault if bit is opposite of what is expected.	The MCU shall read the ASIC's U3 External FET status bit and compares against the expected value.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS--ASIC_WDEN--STATUS--CORR	P0606	This monitor checks if: • Defective system ASIC	• The ASIC shall provide the WDEN Status SPI bit which reflects the filtered state of the WDEN pin. The MCU shall monitor the ASIC's WDEN Status SPI flag and verify it is the expected value.	WDEN Status SPI flag != WDEN PIN status	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_EXCESS_STARTUP	P0606	This monitor checks if: • Defective system ASIC	• During the power-on sequence, the ASIC shall monitor the U5, U3, and U1 voltages, with respect to the discharge voltage threshold. • If the power-on sequence is delayed (e.g. due to a slow U5, U3, U1, discharge), the ASIC shall report the Excessive Startup Time SPI flag.	The MCU shall monitor the ASIC's Excessive Startup Time SPI flag.	• Polaris is initialized	5 msec	Type A MIL Illumination.
SYS--ASIC--EXCESS--STARTUP--AT_SPEED	P0606	This monitor checks if: • Defective system ASIC	• During the power-on sequence, the ASIC shall monitor the U5, U3, and U1 voltages, with respect to the discharge voltage threshold. • If the power-on sequence is delayed (e.g. due to a slow U5, U3, U1, discharge), the ASIC shall report the Excessive Startup Time SPI flag.	The MCU shall monitor the ASIC's Excessive Startup Time SPI flag.	• Polaris is initialized	5 msec	Type A MIL Illumination.
SYS_ASIC_ADC_REF_HIGH	P060B	This monitor checks if: • Defective system ASIC	• The ASIC shall provide three ADC test voltage channels fixed to internal voltage references: Vhigh (ADREFHI),Vlow (GND_Q1), and Vmid (ADREFHI/2).	Each software loop, the MCU shall read the ADC conversion results for the Vhigh, Vlow and Vmid ASIC ADC channels over SPI, and compare them against fixed detection thresholds. Note: This MCU requirement is the same as in SM137.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_ADC_REF_MID	P060B	This monitor checks if: • Defective system ASIC	• The ASIC shall provide three ADC test voltage channels fixed to internal voltage references: Vhigh (ADREFHI),Vlow (GND_Q1), and Vmid (ADREFHI/2).	Each software loop, the MCU shall read the ADC conversion results for the Vhigh, Vlow and Vmid ASIC ADC channels over SPI, and compare them against fixed detection thresholds. Note: This MCU requirement is the same as in SM137.	• Polaris is initialized	25 msec	Type A MIL Illumination.
SYS_ASIC_ADC_REF_LOW	P060B	This monitor checks if: • Defective system ASIC	• The ASIC shall provide three ADC test voltage channels fixed to internal voltage references: Vhigh (ADREFHI),Vlow (GND_Q1), and Vmid (ADREFHI/2).	Each software loop, the MCU shall read the ADC conversion results for the Vhigh, Vlow and Vmid ASIC ADC channels over SPI, and compare them against fixed detection thresholds. Note: This MCU requirement is the same as in SM137.	• Polaris is initialized	50 msec/10 Counts	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SYS_ASIC_ADC_ATTN_BIT_STUCK	P060B	This monitor checks if: • Defective system ASIC	The MCU once per power cycle commands each ASIC external ADC channel with the attenuation mode opposite of normal operation and verify that its attenuation enable feedback SPI bit is not stuck. Commanded 10 times and if 3 in a row are failed the fault is set.	Any one of the 10 ASIC external ADC channel's attenuation enable feedback SPI bits is stuck	• Polaris is initialized	Time 3 ms = Goal 3 counts	Type A MIL Illumination.
SYS_ASIC_ADC_ATTN_FACTOR	P060B	This monitor checks if: • Defective system ASIC	• Each background conversion loop, the ASIC shall perform the conversion of the internal Vmid voltage both with and without the selectable attenuation switched in. The conversion results shall be stored respectively in the separate ADC Vmid with Attenuation Test Result and ADC Vmid Test Result SPI fields. • Each software loop, the MCU shall calculate the ASIC's ADC attenuation factor by reading the ADC Vmid with Attenuation Test Result and ADC Vmid Test Result SPI fields, calculate the ASIC's ADC attenuation factor by dividing the attenuated result by the non-attenuated result, and verify the resulting attenuation factor is within limits.	Calculated ADC attenuation factor < 0.6176 OR Calculated ADC attenuation factor > 0.6320	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_EXT_ADC_FAILURE	P060B	This monitor checks if: • Defective Polaris ASIC.	The ASIC reports the state of the attenuation (selected or not selected) for each external ADC channel via the "ADx Attenuation Feedback" SPI bits within the ADC result registers. For fault detection purposes, the feedback bits directly monitor the control signal state within the SAR Logic, as opposed to only echoing the "ADx Attenuation Select" command. Each time an ASIC external ADC channel is read over SPI, the SW also reads the "ADx Attenuation Feedback" bit and compare the result against the expected (i.e. commanded) attenuation setting.	Compare the ASIC external ADC channel read of SPI and the ADx Attenuation feedback bit against expected attenuation setting	• Polaris is initialized	15ms	Type A MIL Illumination.
SYS_ASIC_SYNC_PULSE_DETECT	P0606	This monitor checks if: • Defective system ASIC	• ASIC provides SYNC ARMED SPI mapped bit that can be set and cleared through SPI, or cleared by detected valid SYNC rising edge event. • Provide un-armed SYNC edge detected SPI mapped bit.	Periodically (e.g. once per ignition cycle) the MCU shall send a rising edge on the SYNC pin, while the SYNC Armed SPI bit is low. The MCU shall verify that the Unarmed SYNC Edge Detected SPI flag is set.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_SPI_DETECT	P0606	This monitor checks if: • Defective system ASIC	• None.	Periodically, and within the fault response time, the MCU shall send separate SPI frames with: (1) an incorrect CRC (2) an incorrect number of SPI bits (3) an invalid command (invalid address) (4) invalid data The MCU shall then verify that the CRC is corrupted in the ASIC's response frame to each of the above errors.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_REGISTER	P0606	This monitor checks if: • Defective system ASIC	• The ASIC shall provide the Storage SPI register. The register contents shall have no effect on the ASIC operation. Register contents shall only be modified by a SPI write and not by any internal ASIC action.	Every major software loop (e.g. 5 - 10ms), the MCU shall perform a write to, normal mode read from and dump mode read from the Storage SPI register. Each loop, the value written shall change, and shall include checkerboard (0xAA,0x55), walking 1s and walking 0s). The MCU shall verify the written and read values match. After performing a write to a safety critical SPI register, the MCU shall perform a read back of the same register, and verify that the contents were written. The read shall occur within the same software loop, in order to allow the MCU to correct any mis-write within the fault response time. Note: The read back refers to a separate read request, and is not the same as verifying the write echo.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_DUPL_SEED	P0606	This monitor checks if: • Defective system ASIC	• None.	The MCU shall detect if ASIC provides the same seed value 3 times in a row.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_AD_REFRESH_FAILURE	P060B	This monitor checks if: • Defective system ASIC	• The ASIC shall set the Data Read bit to indicate that an individual ADC result has been updated since the register was last read.	Each time an ASIC ADC channel is read over SPI, the MCU shall also read the Data Read bit. If the Data Read bit is not set, the MCU treats the result as old data. If the Data Read bit is not set and the time since the prior ADC read is longer than the ASIC ADCs background loop time, the MCU shall detect a fault Periodically (e.g. once per ignition cycle), the MCU shall read each ADC result register immediately 3 times in a row. If the Data Read bit is never low during the 3 reads, flag a fault that the Data Read bit is stuck high. Repeat for all ASIC ADC channels. Note: Because the ASIC could update the result register between two register reads (resulting in two high Data Read bits), 3 successive reads are required.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_AD_DATA_READ_STUCK	P060B	This monitor checks if: • Defective system ASIC	• The ASIC shall set the Data Read bit to indicate that an individual ADC result has been updated since the register was last read.	Periodically (e.g. once per ignition cycle), the MCU shall read each ADC result register immediately 3 times in a row. If the Data Read bit is never low during the 3 reads, flag a fault that the Data Read bit is stuck high. Repeat for all ASIC ADC channels. Note: Because the ASIC could update the result register between two register reads (resulting in two high Data Read bits), 3 successive reads are required.	• Polaris is initialized	1 msec	Type A MIL Illumination.
DC_SOL_ON_TIME_MON_FAILED	P0606	This monitor checks if: • Defective system ASIC ASIC is not controlling PWM properly	The ASIC shall monitor the filtered DRDx feedback voltage and shall provide an on-time counter (for each channel) which shall accumulate the QDRx on-time. At each valid SYNC edge, the ASIC shall latch the current accumulated value into the DRDx On-Time Feedback Register and clear the on-time counter. The MCU shall integrate the commanded on-time between valid SYNC pulses and verify it matches the ASIC's reported result. Current threshold is 250 * MICROSECOND	Compare the solenoid commanded on time to the measured on time. If the difference in the two times is >250 microsec for 10 consecutive checks then the fault is immediately matured	• Polaris is initialized	90 msec	Type A MIL Illumination.
SYS_ASIC_UNEXPECTED_SYNC_PULSE	P0606	This monitor checks if: • Defective Polaris ASIC.	• The MCU shall monitor the ASIC's Unarmed SYNC Edge Detected SPI bit and verify no expected SYNC pin edges have occurs. • After a rising SYNC pin edge has occurred (e.g. at the start of the next software loop), the MCU shall read the ASIC's SYNC Armed Status SPI bit and confirm that the rising SYNC pin edge occurred (in which case the bit will be low).	Fault will set if the MCU detects an unexpected sync pulse from the ASIC by monitoring the Unarmed SYNC Edge Detected SPI bit	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_SYNC_TIMEOUT	P0606	This monitor checks if: • Defective Polaris ASIC. • Defective microprocessor. • Operating system failure	The ASIC detects if the time since the prior valid rising SYNC edge exceeds the SYNC timeout time. Then the ASIC turns off the coil drivers and sets the "SYNC Timeout" SPI bit. The SW monitors the ASIC's "SYNC Timeout" SPI bit to detect if a SYNC Timeout has occurred.	This fault would be set if the SPI bit SYNC Timeout is set for 25msec	• Polaris is initialized	max 17ms	Type A MIL Illumination.
SYS_ASIC_CONFIG_REG_FAILURE	P0606	This monitor checks if: • register error • register rewrite error	• Configuration Registers: (These are written once at startup.) After writing once, read back and verify their contents during every subsequent 5ms SPI loop.	Rewrite registers with an incorrect value Verify if the write was successful during the following 5ms SPI loop's read & verify. If the rewrite is not successful after 3 attempts in a row, set a fault.	• Polaris is initialized	15 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SYS_ASIC_CONTROL_REG_FAILURE	P0606	This monitor checks if: • register error • register rewrite error	• Control Registers: (These are written every 5ms loop for control orfailsafing purposes.) Forthose registers not covered by other SMs, read and verify every 5ms loop, priorto performing the write.	Rewrite registers with an incorrect value Verify if the write was successful during the following 5ms SPI loop's read & verify. If the rewrite is not successful after 3 attempts in a row, set a fault.	• Polaris is initialized	15 msec	Type A MIL Illumination.
ENQ_PIN_FAILED	P0606	This monitor checks if: • Defective ASIC.	• The Polaris ASIC provides a digital push-pull output, ENQ. ENQ is high when the ENQ Enable SPI bit is set, the Watchdog Status is "in range", WDEN Status is high, and nRST Status is high. Otherwise ENQ is low. ENQ is used as a pre-driver to enable ECU circuitry.	The MCU shall continuously monitor the ASIC ENQ feedback signal state and verify that it has the expected state. The HW shall provide a digital feedback signal of ASIC ENQ signal to MCU digital input.	• Polaris is initialized	10 msec	Type A MIL Illumination.
BROKEN_WIRE_TEMP_FDBK_A	P0606	This monitor checks if: • Improper (broken wire) connection between the external analog sensor and the input pin. • Defective microprocessor.	• Conversion results for VHigh and VLow ADC channels are out of range, then Broken Wire fault is set.	• Each software loop, ADC conversion results for VHigh and VLow MMC ADC Channels are read. • If conversion results for VHigh and VLow are out of range, then Broken Wire fault is set.	• Power Switch is ON	5 msec	Type A MIL Illumination.
NVM_REQ_FAILED	P062F	This monitor checks if: • Eep Driver reports JobErrorNotification, indicating that the request failed, either after it was accepted or because the module refused the request	If a user request is either rejected and the number of configured retries expired or if it was accepted and then failed, while being processed by the underlying memory stack module.	NvM_CurrentBlockInfo_t.LastResult_t != NVM_REQ_OK	Continuous failsafing	3 count	Type A MIL Illumination.
NVMJNTEGRITY.F AILED	P062F	This monitor checks if: • If the read for a block detects that the data and/or CRC are corrupted based on the CRC check performed after the read was finished successfully	If the processing of a read request will detect, via the CRC checking, corruption of the data and/or CRC of the block that was subject to the read operation.	NvM_CurrentBlockInfo_t.LastResult_t == NVM_REQ_INTEGRITY_FAILED	Continuous failsafing	1 count	Type A MIL Illumination.
NVM_LOSS_OF_REDUNDANCY	P062F	This monitor checks if: If the contents are different, if the first instance becomes corrupted or if the first instance cannot be read then NvM will report this fault.	If the reading performed over a REDUNDANT block indicates the block has lost its redundancy.	one block is OK, other isn't -> block isn't redundantly stored within NV RAM. if(firstBlockDefect ^ secondBlockDefect) — TRUE	Continuous failsafing	1 count	Type A. MIL Illumination.
NVM_QUEUE_OVERFLOW	P062F	This monitor checks if: If the number of requests made to NvM exceeds the size of the queue and none of the ones in the queue finishes, NvM will not have any more space where to store the requests. In this case it will report the fault to Dem.	If a request is made that cannot be stored in the NvM queue (be it standard or immediate) as all configured queue positions of the related queue are already containing user requests.	queue was full, request to queue the next block leads to queue overflow	Continuous failsafing	1 count	Type A MIL Illumination.
EEP_FAILURE	P062F	This monitor checks if: SPI transmission is faulty	The failure is set in case of a failed sequence due to a failure of the SPI transmission. A sequence can also fail if a transfer was rejected because of full transmit buffer.	EEP_E_CANCEL_FAILED - DEM event if a job cancelation failed EEP_E_READ_FAILED - DEM event if read job failed EEP_E_COMPARE_FAILED - DEM event if compare job failed EEP_E_TEST_COM_FAILED2 - DEM event if test communication job failed EEP_E_WRITE_FAILED - DEM event if write job failed EEP_E_ERASE_FAILED - DEM event if erase job failed	Continuous failsafing	3 count	Type A. MIL Illumination.
SYS_ASIC_U1_SELECT_FAILURE	P0606	This monitor checks if: • Defective printed circuit board. • Defective ASIC. • Defective microprocessor.	• The U1 operating mode and voltage level selections are viewable via the U1 Mode Select Status and U1 Voltage Select Status SPI fields. The SPI feedback signals are internally routed so that they monitor the true state of the mode and voltage control circuits.	The MCU verifies that the U1 Mode Select Status and U1 Voltage Select Status SPI fields in register 0x45 match the values which are hard-coded into SW corresponding the application's intended HW population. If a mismatch is detected, fault is set.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_SM_DISABLED	P0606	This monitor checks if: • Defective printed circuit board. • Defective ASIC. • Defective microprocessor.	• The ASIC shall set the Safety Mechanisms Disabled SPI bit when a test mode is active which prevents the ASIC from resetting the MCU or disabling power supplies in reaction to a fault.	The MCU shall periodically verify that the Safety Mechanisms Disabled SPI bit is low. If the bit is read as high, fault is set.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS_ASIC_SPI_TRANSFER_ERROR	P0606	This monitor checks if: • SPI transfer error • ASIC problem • PCB problem	• The micro monitors the SPI data transmissions and checks for SPI transfer errors	If any of the below errors are observed in Spi Data transmission this fault will set. POLARIS-SPI-NOTJNITIALIZED POLARIS-SPI-TRANSFER.REJECTED POLARIS_SPI_TX_MSG_LENGTH_ERROR	• Continuous failsafing	15 msec	Type A MIL Illumination.
Group 5 - Microcontroller							
ROM_CRC_FAILURE	P0606	This monitor checks if: • Defective microprocessor • Incorrect fault detection algorithm	• CRC ROM Failure R4 • The ROM self-test is a dynamic test that is called from the scheduler at a rate of 5 msec. Each ROM section is checksummed byte by byte. Each byte will be added to the current checksum for a section. If the byte being checked is the last byte of a section, then the setion is verified for a correct checksum stored at the end of the section.	calculated CRC I = stored CRC	• Power Switch is ON	5 msec	Type A MIL Illumination.
OS_TASK_MONITOR_FAULT_COREO	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	Checks to be sure that all tasks on CPUOare running	Checks to be sure that all tasks on CPUOare running	Always Enabled	1 count	Type A MIL Illumination.
OS_TASK_MONITOR_FAULT_CORE1	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	Checks to be sure that all tasks on CPU1 are running	Checks to be sure that all tasks on CPUOare running	Always Enabled	1 count	Type A MIL Illumination.
OS_TASK_MONITOR_FAULT_CORE2	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	Checks to be sure that all tasks on CPU2 are running	Checks to be sure that all tasks on CPUOare running	Always Enabled	1 count	Type A MIL Illumination.
OS_INTERNAL_FAILURE_COREO	P0606	This monitor checks if: Failure in a hardware system that the OS depends on.	The OS has detected a serious failure such that, as determined by the OS vendor, it cannot continue safe operation on at least 1 CPU. This is most likely because of a failure in a hardware system that the OS depends on.	None	Always Enabled	10 msec	Type A MIL Illumination.
OS_INTERNAL_FAILURE_CORE1	P0606	This monitor checks if: Failure in a hardware system that the OS depends on.	The OS has detected a serious failure such that, as determined by the OS vendor, it cannot continue safe operation on at least 1 CPU. This is most likely because of a failure in a hardware system that the OS depends on.	None	Always Enabled	10 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
OS_INTERNAL_FAILURE_CORE2	P0606	This monitor checks if: Failure in a hardware system that the OS depends on.	The OS has detected a serious failure such that, as determined by the OS vendor, it cannot continue safe operation on at least 1 CPU. This is most likely because of a failure in a hardware system that the OS depends on.	None	Always Enabled	10 msec	Type A MIL Illumination.
RTOS_FAILURE_COREO	P0606	This monitor checks if: Software Error	EB OS detects an error situation and calls ErrorHook with a status code for which there is no other fault code.	None	Always Enabled	5*Number of errors in 10ms update Cycle	Type A MIL Illumination.
RTOS_FAILURE_CORE1	P0606	This monitor checks if: Software Error	EB OS detects an error situation and calls ErrorHook with a status code for which there is no other fault code.	None	Always Enabled	5*Number of errors in 10ms update Cycle	Type A MIL Illumination.
RTOS_FAILURE_CORE2	P0606	This monitor checks if: Software Error	EB OS detects an error situation and calls ErrorHook with a status code for which there is no other fault code.	None	Always Enabled	5*Number of errors in 10ms update Cycle	Type A MIL Illumination.
UNEXPECTED_EXCEPTION_COREO	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	The CPU detects a situation where it cannot successfully complete an instruction, such no memory exists at the read/write address or instruction code is invalid. The CPU branches to a predefined Trap address and control is transferred to the Elektrobit OS. The EB OS will call ProtectionHook with status code E_OS_PROTECTION_EXCEPTION provided the following two aspects are true. 1 - The trap was not a normal function of the OS. 2 - The OS does not have another more specific error code to use, such as E_OS_PROTECTION_MEMORY for a MPU violation.	None	Always Enabled	10 msec	Type A MIL Illumination.
UNEXPECTED_EXCEPTION_CORE1	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	The CPU detects a situation where it cannot successfully complete an instruction, such no memory exists at the read/write address or instruction code is invalid. The CPU branches to a predefined Trap address and control is transferred to the Elektrobit OS. The EB OS will call ProtectionHook with status code E_OS_PROTECTION_EXCEPTION provided the following two aspects are true. 1 - The trap was not a normal function of the OS. 2 - The OS does not have another more specific error code to use, such as E_OS_PROTECTION_MEMORY for a MPU violation.	None	Always Enabled	10 msec	Type A MIL Illumination.
UNEXPECTED_EXCEPTION_CORE2	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	The CPU detects a situation where it cannot successfully complete an instruction, such no memory exists at the read/write address or instruction code is invalid. The CPU branches to a predefined Trap address and control is transferred to the Elektrobit OS. The EB OS will call ProtectionHook with status code E_OS_PROTECTION_EXCEPTION provided the following two aspects are true. 1 - The trap was not a normal function of the OS. 2 - The OS does not have another more specific error code to use, such as E_OS_PROTECTION_MEMORY for a MPU violation.	None	Always Enabled	10 msec	Type A MIL Illumination.
FSMC_MISMATCH-VELOCITY	P0606	This monitor checks if: • Defective • Microprocessor • At least one • wheel velocity • calculation • between • Main timer and Redundant timer does not agree	• Mismatched Wheel Velocity Failure • Both main timerand redundant timer are calculating the velocity for each wheel. All wheel speeds computed by the main timer are transmitted to the redundant timer every loop time. The redundant timer compares them to the appropriate velocities received from the main timer.	Tolerance of any wheel velocity calculations is > +/- 10 km/h	•High wheel acceleration inhibits this routine	35 ms	Type A MIL Illumination.
LOGICAL_SEQUENCE.F AULT_COREO	P0606	This monitor checks if: Improper sequencing of runnables	If the software finds mismatch in current sequence compared to predefined sequence of the runnables then LSM flag in Core 0 is set.	Fault is set if LSM flag in Core 0 is set.	Continuous Failsafing	1 count	Type A MIL Illumination.
LOGICAL-SE QUENCE.F AULT_CORE1	P0606	This monitor checks if: Improper sequencing of runnables	If the software finds mismatch in current sequence compared to predefined sequence of the runnables then LSM flag in Core 1 is set.	Fault is set if LSM flag in Core 1 is set.	Continuous Failsafing	1 count	Type A MIL Illumination.
LOGICAL—SEQUENCE.F AULT.CO RE2	P0606	This monitor checks if: Improper sequencing of runnables	If the software finds mismatch in current sequence compared to predefined sequence of the runnables then LSM flag in Core 2 is set.	Fault is set if LSM flag in Core 2 is set.	Continuous Failsafing	1 count	Type A MIL Illumination.
CPU-FAILURE-SEVERITY.X	P0606	This monitor checks if: • Defective microprocessor • Improper Application Code	The SW shall configure the MCU's fault manager to signal MCU faults via alarm but don't require the MCU to be held in reset.	See Aurix_Alarms_Update.xlxs for which alarm indicates what MCU faults and set the CPU_FAILURE_SEVERITY_X fault.	• Power Switch in ON		Type A MIL Illumination.
CPU_FAILURE—SEVERITY.Y	P0606	This monitor checks if: • Defective microprocessor • Improper Application Code	Activates the FSP then checks to see if it truly got activated. Also, checks to see if the ASIC saw the FSP pin activate.	If Polaris feedback does not match FSP command OR If Aurix feedback does not match FSP command	• Power Switch in ON		Type A MIL Illumination.
CPU.FAILURE.S EVERITY.TRANSIENT	P0606	This monitor checks if: • Defective microprocessor • Improper Application Code	The SW shall configure the MCU's fault manager to signal MCU faults via alarm and configures hardware intervention to hold MCU in reset. When the alarm occurs, SW stores information in NVRAM. On the next Ignition cycle if SW sees indication stored in NVRAM that indicates we had an FSP occur, we set the fault. Note: There is no gaurantee that SW is able to write to NVRAM depending on what has failed.	See Aurix_Alarms_Update.xlxs for which alarm indicates what MCU faults and set the CPU_FAILURE_SEVERITY_TRANSIENT fault.	• Power Switch in ON		Type A MIL Illumination.
SYS—ASIC_SYNC_TIME_MISMATCH_FAULT	P0606	This monitor checks if: • Defective system ASIC	• At each valid SYNC edge, the ASIC shall store the time between that edge and the prior valid SYNC edge in the Prior SYNC Interval Time SPI register field.	The MCU shall measure time between SYNC edges (based upon the MCU clock) and verify the time matches the ASIC's Prior SYNC Interval Time SPI field.	• Polaris is initialized	15 msec	Type A MIL Illumination.
SYS—ASIC—DRIVER—SHORT—DETECT	P0606	This monitor checks if: • Defective system ASIC	• The ASIC shall not automatically inhibit the Shorted Driver Detection (SM37) when the SSR is off.	Periodically (e.g. once per ignition cycle), the MCU shall disable the SSR, enable the CC_DRx and DROx drivers, command 0A or 0% duty cycle, and verify that the Open Coil / Shorted Driver Warning Valid bits are set, and verify that a Shorted Driver Warning is reported on each driver channel.	• Polaris is initialized	15 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SYS_ASIC_SSR_SELF_TEST_FAILED	P0604	This monitor checks if: • Solid State Relay problem • Defective ASIC • PCB problem	• The MCU performs various tests on the Solid State Relay during System Self Test.	(1a) Set/Command: Watchdog Counter Value SPI field = 0, WDEN pin low, the Enable Failsafe SSR SPI bit = 0, and the SSR Shut Off Pin low (= off). (1b) Verify the Coil Supply Voltage is low. (2a) Set the WDEN pin high, the Enable Failsafe SSR SPI bit = 1, and the SSR Shut Off Pin high (=on). Do not service the Watchdog. (2b) Verify the Coil Supply Voltage is low. (3a) Service Watchdog until the Watchdog Counter Value SPI field = 6. (3b) Verify the Coil Supply Voltage is low. (4a) Set the WDEN pin low, then service the Watchdog once, such that the Watchdog Counter Value SPI field = 7. (4b) Verify the Coil Supply Voltage is low. (5a) Set the Enable Failsafe SSR SPI bit = 0, then set the WDEN pin high. (5b) Verify the Coil Supply Voltage is low. (6a) Set the SSR Shut Off Pin low (= off), then set the Enable Failsafe SSR SPI bit = 1. (6b) Verify the Coil Supply Voltage is low. (7a) Allow the Watchdog to timeout, then set the SSR Shut Off Pin high (= on). The time between (4a) and (7a) should be counted toward the required timeout time. If the time between (4a) and (7a) is more than 34ms, a watchdog service event must be added in-between to prevent the Watchdog from timing out before (7a). (7b) Verify the Coil Supply Voltage is low and verify the Watchdog Counter Value SPI field = 0. If any of the above tests failed , retry the re enable all the inputs that are being disabled for this test, and re run this test two more times. If it is still failed then set the fault. If any of the above tests failed , retry the re enable all the inputs that are being disabled for this test, and re run this test two more times. If it is still failed then set the fault.	• Runs during initialization	30 msec	Type A MIL Illumination.
SYS_ASIC_WDOG_COUNT_TEST_FAILED	P0606	This monitor checks if: • Watchdog problem • Defective ASIC • PCB problem	• This fault tests the watchdog by purposefully allowing the watchdog to time out and checking to see how the watchdog reacts	Allow the Watchdog to timeout. Timeout shall occur 34ms to 42ms after the last watchdog service occurred, The time taken to timeout the watchdog counter should be counted toward the required timeout time. If the time is not in a range of 34 to 42 msec this fault should set	• Runs during initialization	34 msec	Type A MIL Illumination.
WDOG_DYNAMIC_TEST_FAILURE	P0606	This monitor checks if: • Defective printed circuit board. • Defective ASIC. • Defective microprocessor.	• Watchdog Dynamic Test Failure • The micro sends a bad watchdog response value back to the ASIC periodically to verify that the ASIC does move towards disabling the system when the watchdog is not correctly being updated. Each loop, the watchdog status counter is checked. After the bad value is sent, the logic tests the status counter to verify that it moved towards disabling the system. If the ASIC operation did not move towards disabling the system, the logic assumes that the watchdog is not able to function properly. As a result, the logic disables the system because the watchdog operation cannot be assumed to be correct. 2 occurrences of this failure is needed to set the fault.	If the ASIC operation has not moved towards disabling the system, the logic assumes that the watchdog is notable to function properly. As a result, the logic disables the system because the watchdog operation cannot be assumed to be correct. 2 occurrences of this failure is needed to set the fault.	• Power Switch is ON	10 msec	Type A MIL Illumination.
SYS_ASIC_LOGIC_RST_STUCK_DETECT	P0606	This monitor checks if: • Reset source register problem • ASIC problem • PCB problem	• The MCU continuously monitors the External LOGIC_RST Reset SPI bit within the Reset Source Register.	The MCU shall read the ASIC's External LOGIC_RST Reset SPI field. If the SPI bit is high, fault is set.	• Continuous failsafing	15 msec	Type A MIL Illumination.
MULTIPLE_STARTUP_FAILURE	P0606	This monitor checks if: • Defective CPU	The library of micro safety tests are run at every power-up. If any test fails the results are stored and the system is soft reset. If after the reset, any different test or procedure fails then a MULTIPLE_STARTUP_FAILURE is latched	Any two different Safety Test flags are reported as FAILED in two consecutive tests	Enabled at power up	1 count	Type A MIL Illumination.
SBST_CORE2_FAILURE	P0606	This monitor checks if: Failure of the CPU core	Fault is set if SafeTlib test "CpuTst_CpuSbstPTst()" fails	Every 1 second the SafeTlib test "CpuTst_CpuSbstPTst()" is run. The fault is set if it returns a failure.	Continous - Always enabled	1 Count	Type A MIL Illumination.
UNIMPLEMENTED_INTERRUPT_COREO	P0606	This monitor checks if: Defective CPU	When the failsafe is called during runtime, it will loop through all the SRC registers to find if there is any pending interrupt from disabled interrupt source	If SRPN bits in SRC register of Interrupt router is zero then the fault will set if SRR bit of SRC register is set	Continuous Failsafing	300 counts	Type A. MIL Illumination.
SMU_IOM_TEST_FAILURE	P0606	This monitor checks if: • Defective CPU	This fault is created based on the Infineon safety manual: - "Once per driving cycle, the Application SW shall test the correctness of IOM (input/output monitor) alarm generation, by configuring GTM (Global Test Mode) and IOM for triggering an alarm under known conditions." - The fault is to check if the IOM module is capable of generating the SMU alarm. - The failsafe logic is: set a condition that IOM will trigger an alarm, if it does, then the failsafe passed, otherwise failed. - For SMU_IOM_TEST_FAILURE, when the 3 way coil (primary) is first commanded with duty cycle between 7.5% to 92.5% after ECU self test is completed (and this failsafe has not been run yet), a feedback duty cycle threshold will set (to IOM register) to make the IOM trigger the too short alarm, if alarm is not triggered, the fault is set, otherwise, fault is passed and test is done. Note: the IOM has to detect PWM (Pulse Width modulation) edges to trigger the alarm, thus 100% duty cycle is not the condition to do this test.	Register value is not equal to test value written to it	performed at power up	1 count	Type A MIL Illumination.
CPU_BUS_MPU_CONFIG_REGISTER_READBACK_FAILURE	P0606	This monitor checks if: • Defective CPU	After the MPU has been initialized it will loop through a table of MPU registers and compare each register value to the value that the MCAL has previously written to it. If there is a difference, then the MPU will be unlocked, the register updated, and then the SMU will be put back to it's previous state. The register will then be checked again. If it fails 3 times, then the CPU_MPU_CONFIG_REGISTER_READBACK_FAILURE will be set.	Register value is not equal to test value written to it.	performed at power up	1 count	Type A MIL Illumination.
MPU_CONFIGREGISTER_READBACK_FAILURE	P0606	This monitor checks if: • Defective CPU	After the MPU has been initialized, the registers will be checked to sure the have the correct values. If any register is incorrect, it will be rewritten and checked again. The fault will be set if the register is still incorrect.	register value is not equal to value written to it	performed at power up	1 count	Type A MIL Illumination.
EVADC_CONFIG_REGISTER_READBACK_FAILURE	P0606	This monitor checks if: • Defective CPU	This failsafe is to verify if the ADC GxANCFG registers' values match those configured in MCAL (Micro-Controller Abstraction Layer) at power initial time. - Failsafe will pass if register values match those configured in MCAL - If they do not match, allow value in MCAL to write to register once again - Fault will set if they still do not match after second attemp Note: ADC is tied to Core CPU ID, and only used Kernels are included in failsafe.	register value is not equal to test value written to it	performed at power up	1 count	Type A MIL Illumination.
MICRO_CLOCK_PLAUSIBILITY_FAILURE	P0606	This monitor checks if: • Defective CPU	The ASCLIN is configured to send 7.5 msec worth of data. If it finishes either too fast, or too slow, that indicates that the PLL for the peripheral is incorrect. The fault will then be set.	Peripeheral clock dividers mismatch with System clock	Always Enabled	10 counts	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MCU_FW_CHECK_FAILURE	P0606	This monitor checks if: • Defective CPU	A list of registers is compared to a known set of values to ensure that the Infineon firmware executed correctly. If there is a mismatch, the CPU is reset, and the test is rerun. The fault is set if there is still a mismatch.	One or more registers != expected value	performed at power up	1 count	Type A MIL Illumination.
STM_PLAUSIBILITY_FAILURE	P0606	This monitor checks if: • Defective CPU	STM and TBU timers are read without interrupt between, then after 20 ms, STM and TBU elaspsed times are read without interrupt between the readings, the 2.5% error is checked and Up/down failsafe monitor function is called. The fault is continiously checked every 20 ms.	The difference between the System Timer and Time Base Unit channel 1 >= 2.5%	Enabled at power up	105 msec	Type A MIL Illumination.
RAM_STARTUP_MBIST_FAILURE	P0604	This monitor checks if: • Defective CPU	The micro runs a RAM self test at power-up. If a failure is detected the the BIST is rerun after a warm reset. If a failure still exists then the failed bit will be set	If the failed bit is TRUE then set the fault	performed at power up	1 count	Type A MIL Illumination.
MCU_STARTUP_FAILURE	P0606	This monitor checks if: • UCB Configuration incorrect • UCB corrupted • Micro incorrectly loading UCB values into registers	A list of registers is CRCed (Cyclic Redundancy Code), (all derived from User Configuration Block [UCB] values). - The resulting CRC value is compared to the expected CRC value. - If there is a mismatch, the CPU is reset, and the test is rerun. - The fault is set if it fails again.	Calculated CRC != Expected CRC	performed at power up	1 count	Type A MIL Illumination.
INTERNAL_BUS_MONITOR_CORE2_FAILURE	P0606	This monitor checks if: • CPU2 failure	At startup, the CPU internal FIFOs (Store buffers, bus interfaces), the CPU internal bus connectivity to SRI Master and Slave interfaces (Read and Write), and the CPU internal bus connectivity to the DLMU are checked. (DLMU: Direct-connected Local Memory Unit) If a failure is detected, the check is run again. The fault is set if a failure is detected twice.	CpuBusMonitor() returns FALSE	Always Enabled	1 count	Type A MIL Illumination.
LBIST_FAILURE	P0606	This monitor checks if: • Microprocessor Failure	At powerup, the Infineon Firmware executes the LBIST. The Application code then compares the resulting LBIST signature to the expected signature. The fault is set if there is a mismatch.	LBIST signature != Expected LBIST signature	Always Enabled	1 count	Type A MIL Illumination.
REG_MONITOR—TEST_FAILURE	P0606	This monitor checks if: • Microprocessor Failure	At powerup, the Safety Flip Flops (SFFs) used in certain functional blocks is checked. If there is a failure, the CPU is reset, and the test is rerun. The fault is set if the failure still persists after the reset.	Mtu_RegMonitorTest() returns REG_MON_TEST_FAILED (5)	Always Enabled	1 count	Type A MIL Illumination.
MONBIST—FAILURE	P0606	This monitor checks if: • Microprocessor Failure	If the Monitor Built-In Self Test (MONBIST) returns a failure, the CPU is reset and the test is rerun. The fault is set if the MONBIST fails again.	PMS-MONBISTSTAT.B.TSTOK != MONBIST_STATUS_CHECK (1)	Always Enabled	1 count	Type A MIL Illumination.
SFR_READBACK_FAILURE	P0606	This monitor checks if: • Microprocessor Failure	A group of safety critical registers is checked correct values. If a value is incorrect, it is updated. The fault is set if either a value could not be corrected, or there are more than 3 registers that need to be corrected.	Read register value != Expected value	Always Enabled	3 counts	Type A MIL Illumination.
Group 6 - ABS Pump Motor							
Group 7 - IBC Motor							
MD_IEM_OCCURRENCE_FAULT	C0582	This monitor checks if: • Bridge FET failure • Invalid execution rate of a motor interrupt.	Compares the number of times each electric drive interrupt has occurred in a 4ms period, and sets if the interrupt count does not fall in an acceptable range	The occurrence counter of any enabled motor interrupt is outside an expected interval.	ECU is not shutting down.	1 count/4 ms	Type A MIL Illumination.
MD_IEM_PLAUSIBILITY_FAULT	C0582	This monitor checks if: • Bridge FET failure • Invalid execution reason of a motor interrupt.	This fault sets if a motor control interrupt is executed with the wrong proirity level, or an interrupt is executed when it should be disabled.	Either a motor interrupt has been executed which wasn't explicitly enabled.	Motor Drive is in either "Running" or "Paused" state (i.e. not in "Init" or intermediate "Resuming" or "Terminated" state)	1 count	Type A MIL Illumination.
MD_MOTOR_PHASE_VOLTAGE_1_HIGH_FAULT	C057F	This monitor checks if: Bridge FET failure	When phase 1 voltage is high, the microcontroller shall capture (M1_PH1_SEN phase voltage high), if (M1_PH1_SEN phase voltage high) is less than RT_PHASE_VOLTAGE_HIGH_MIN then this fault is raised. Motor Phase Voltage HIGH Test is executed when the Inverter FET is switched on. IF motor phase <n> voltage < PHASE VOLTAGE THRESHOLD HIGH THEN faulty bucket is incremented	M1_PH1_SEN phase voltage high < 3.46V	executed when the Inverter FET is switched on. Motor PWM is on	18 msec/128 counts	Type A MIL Illumination.
MD_MOTOR_PHASE_VOLTAGE_1_LOW_FAULT	C0580	This monitor checks if: Bridge FET failure	When phase 1 voltage is low, the microcontroller shall capture (M1_PH1_SEN phase voltage low), if (M1_PH1_SEN phase voltage low) is greater than RT_PHASE_VOLTAGE_LOW_MAX then this fault is raised Motor Phase Voltage LOW Test is executed when the lower Inverter FET is switched on. IF motor phase <n> voltage > PHASE VOLTAGE THRESHOLD LOW THEN faulty bucket is incremented	M1_PH1_SEN phase voltage low > 0.99V	executed when the lower Inverter FET is switched on. Motor PWM is on	18 msec/128 counts	Type A MIL Illumination.
MD_MOTOR_PHASE_VOLTAGE_2_HIGH_FAULT	C057F	This monitor checks if: Bridge FET failure	When phase 2 voltage is high, the microcontroller shall capture (M1_PH2_SEN phase voltage high), if (M1_PH2_SEN phase voltage high) is less than RT_PHASE_VOLTAGE_HIGH_MIN then this fault is raised. Motor Phase Voltage HIGH Test is executed when the Inverter FET is switched on. IF motor phase <n> voltage < PHASE VOLTAGE THRESHOLD HIGH THEN faulty bucket is incremented	M1_PH1_SEN phase voltage high < 3.46V	executed when the Inverter FET is switched on.	18 msec/128 counts	Type A MIL Illumination.
MD_MOTOR_PHASE_VOLTAGE_2_LOW_FAULT	C0580	This monitor checks if: Bridge FET failure	When phase 2 voltage is low, the microcontroller shall capture (M1_PH2_SEN phase voltage low), if (M1_PH2_SEN phase voltage low) is greater than RT_PHASE_VOLTAGE_LOW_MAX then this fault is raised. Motor Phase Voltage LOW Test is executed when the lower Inverter FET is switched on. IF motor phase <n> voltage > PHASE VOLTAGE THRESHOLD LOW THEN faulty bucket is incremented	M1_PH1_SEN phase voltage low > 0.99V	executed when the lower Inverter FET is switched on.	18 msec/128 counts	Type A MIL Illumination.
MD_MOTOR_PHASE_VOLTAGE_3_HIGH_FAULT	C057F	This monitor checks if: Bridge FET failure	When phase 3 voltage is high, the microcontroller shall capture (M1_PH3_SEN phase voltage high), if (M1_PH3_SEN phase voltage high) is less than RT_PHASE_VOLTAGE_HIGH_MIN then this fault is raised. Motor Phase Voltage HIGH Test is executed when the Inverter FET is switched on. IF motor phase <n> voltage < PHASE VOLTAGE THRESHOLD HIGH THEN faulty bucket is incremented	M1_PH1_SEN phase voltage high < 3.46V	executed when the Inverter FET is switched on.	18 msec/128 counts	Type A MIL Illumination.
MD_MOTOR_PHASE_VOLTAGE_3_LOW_FAULT	C0580	This monitor checks if: Bridge FET failure	When phase 3 voltage is low, the microcontroller shall capture (M1_PH3_SEN phase voltage low), if (M1_PH3_SEN phase voltage low) is greater than RT_PHASE_VOLTAGE_LOW_MAX then this fault is raised. Motor Phase Voltage LOW Test is executed when the lower Inverter FET is switched on. IF motor phase <n> voltage > PHASE VOLTAGE THRESHOLD LOW THEN faulty bucket is incremented	M1_PH1_SEN phase voltage low > 0.99V	executed when the lower Inverter FET is switched on.	18 msec/128 counts	Type A MIL Illumination.
MD_PU_BRIDGE_ERR_STUCK_HI_FAULT	C0582	This monitor checks if: • Bridge Driver ERR line connectivity • Bridge driver incorrect operation.	Verify Error line goes active (low), when error condition is injected.	During self test, the Bridge Driver HW error output pin (IOHWAB_BRIDGE_1_ERROR) was not active, when Current Sense Amplifier 1&2 - Gain 2 was set to a invalid value	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	32 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MD_PU_BRIDGE_ERR_STUCK_LO_FAULT	C0582	This monitor checks if: • Bridge Driver ERR signal connectivity.	Verify Error line goes inactive (high), when injected error condition is removed.	When Bridge configuration is started by driving the HW output Pin (IOHWAB_BRIDGE_1_INHIBIT) inactive, the HW Input Pin (IOHWAB_BRIDGE_1_ERROR) stays active.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	20 - 30ms	Type A MIL Illumination.
MD_PU_BRIDGE_INIT_TIMEOUT_FAULT	C0582	This monitor checks if: • Micro controller SPI failure. • Bridge Driver failure.	Verify Bridge Driver initialization completed within SPUT_DRV_INIT_MAX_TIME.	If initialization of the bridge driver does not occur within 100ms @ 1ms /bit	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	1 count/1ms	Type A MIL Illumination.
MD_PU_BRIDGE_MAX_POWER_DOWN_FAULT	C0582	This monitor checks if: • Incorrect Bridge Driver operation	Allow only BD_PU_MAX_POWER_DOWN_CYCLES of retry, during Bridge Driver power up sequence.	The number of power down cycles during a bridge driver power up sequence exceeds 3.	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	1 count/1ms	Type A MIL Illumination.
MD_PU_BRIDGE_OC_TIMEOUT_FAULT	C0582	This monitor checks if: • Incorrect Bridge Driver operation	Verify intermediate over current tests are completed within SPUT_DRV_OVER_CURRENT_MAX_TIME.	Immediate overcurrent tests are not completed within 10ms @ 0.1us/bit	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	2 counts/2ms	Type A MIL Illumination.
MD_PU_BRIDGE_OCT_NOT_COMPLETED	C0582	This monitor checks if: • Incorrect Bridge Driver operation	Verify over current test is completed within SPUT_DRV_OCT_MAX_EXECUTION_TIME.	Overcurrent tests are not completed within 50ms @ 0.1us/bit	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	2 counts/2ms	Type A MIL Illumination.
MD_PU_BRIDGE_UNACCEPTABLE_ERR	C0582	This monitor checks if: • Incorrect Bridge Driver operation	Verify no un-acceptable errors are reported by Bridge device during power up.	If the below unacceptable error bits are set. - Global test mode (gtm) - Overvoltage Internal Regulator 6 Error (err_ov_reg6) -Charge Pump 1 Overload Error(err_cp1) - Charge Pump 2 Overload Error (err_cp2) - Overtemperature Shutdown (sd_ot) - Charge PumpOvervoltage Shutdown at Pin CB or Pin CH2-CL2 (sd_ov_cp), -Vs Path Charge Pump Input Overload (sd_cp1), - Overtemperature Detection (err_ot_w) - Latent Fault Warning (flw) - Error Correction of Control Register Failed(ctrl_reg_invalid), - err_ov_id_vd h in External Errors.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	3 counts/3ms	Type A MIL Illumination.
MD_PU_BRIDGE_CONFIGSTATE_CHG_FAULT	C0594	This monitor checks if: • Micro controller SPI failure. • Bridge Driver failure.	This failsafe guarantees that the bridge driver is in an acceptable mode (Normal, Safe Off, Config, or Error) during the power-up test sequence. Unknown, Idle, Config Lock, Self Test, Rectification, and Sleep modeswill cause this fault to latch.	Bridge Driver remains in "Idle Mode" for 5ms in which it was expected that it transits to "Configuration Mode", after the configuraion has been sent via SPI.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	145 ms	Type A MIL Illumination.
MD_PU_BRIDGE_OVER_CURRENT.FAULT	C0590	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC • Bad motor	This failsafe tests that over current detection on the bridge driver is working as it should. This failsafe operates during the power-up test.	Self test was started and Current Sense Amplifier 1&2 - Gain 2 was set to a invalid value and bridge driver error output pin (IOHWAB_BRIDGE_1_ERROR) was active, but over current fault bit was not set in sBridgeDriver.CurrentSenseAmpErrorStatus. OR Self test was startedandCurrent Sense Amplifier 1&2 - Gain 2 was set to a valid value and bridge driver error output pin (IOHWAB_BRIDGE_1_ERROR) was inactive, but over current fault bit was set in sBridgeDriver.CurrentSenseAmpErrorStatus.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	40 msec	Type A MIL Illumination.
MD_PU_BD 1_TOP_FET_SC_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge Driver 1 configured and in Normal Operation. With all Bridge 1 bottom FETs off, drive all Bridge 1 top FETs ON. If Bridge 1 ERR line is active, Bridge 1 top FET is short circuit.	During top FETs short circuit test, the bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) when the bottom FETs are turned on while the top FETs are commanded off.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	n/a	Type A MIL Illumination.
MD_PU_BD 1_BOT_FET_SC_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge Driver 1 configured and in Normal Operation. With all Bridge 1 top FETs off, drive all Bridge 1 bottom FETs ON. If Bridge 1 ERR line is active, Bridge 1 bottom FET is short circuit.	During bottom FETs short circuit test, the bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) when the top FETs are turned on while the bottom FETs are commanded off.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	n/a	Type A MIL Illumination.
MD_PU_BD 1_CB_UV_TIMEOUT_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge Driver CB under voltage test was not completed within 150ms.	Bridge Driver CB under voltage test time >= 150 ms	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	n/a	Type A MIL Illumination.
MD_PU_BD 1_SOFF-ACTIVE_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	When SOFF was activated and FETs were driven, Bridge FETs were not switched off (change in current was observed on Isense).	During SOFF Active test, absolute phase current difference between two samples was > 1.1 amps. First sample is taken without any FETs driven, second sample is taken with B2, B3, T1 FETs driven.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	n/a	Type A MIL Illumination.
MD_PROXY_OVERFLOW_FAULT	C0582	This monitor checks if: 1ms tasks not executing properly.	The DemProxy buffer is full when a new DEM status event is passed to DemProxy_setEventStatus().	DemProxy buffer is full.	The DemProxy buffer is full when a new DEM status event is passed to DemProxy_setEventStatus().	4ms	Type A MIL Illumination.
MD_ED_DMA_ERROR_FAULT	C0582	This monitor checks if: Microprocessor DMA peripheral not operating properly	An error interrupt service request has been generated by the Direct Memory Access (DMA) peripheral device.	Direct Memory Access peripheral device experiences an interrupt during service request.	n/a	n/a	Type A MIL Illumination.
MD_M1_ADC_CROSS_CHECK_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge 1 amplifier voltage reference is out of the range BD_ACC_VRO_MINIMUM_LIMIT to BD_ACC_VRO_MAXIMUM_LIMIT, or amplifier output current during "zero motor current flow" is out of the range BD_ACC_ISENSE_OA_MINIMUM_LIMIT to BD_ACC_ISENSE_OA_MAXIMUM_LIMIT	Amplifier output current during "zero motor current flow" is out of the range -10 amps to 10 amps.	• ECU assist enabled AND • ECU is not initializing or shutting down	20ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MD_BD_1_F ET_DIAGJN VALID	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND Assist is lost before the diagnostic completes and within FET_DIAG_MAX_RETRY_TIME OR sBridgeDriver.LimpHomeActive is not set within FET_DIAG_MAX_RETRY_TIME OR MotorStateMach ine.State is not MSM_Running after entering Limp Home mode and within FET_DIAG_MAX_RETRY_TIME OR Diagnostic has not been active before and yet sBridgeDriver.LimpHomeActive is set OR No irregularities have been detected in the respective phase feedback signal	SPI status "error flag" is set AND Assist is lost before the diagnostic completes and within 17ms OR sBridgeDriver.LimpHomeActive is not set within 17ms OR MotorStateMach ine.State is not MSM_Running after entering Limp Home mode and within 17ms	• ECU assist enabled AND • ECU is not initializing or shutting down	20ms	Type A MIL Illumination.
MD_BD_1_MULTIPLE_FET_FAILURE	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors more than one of the "Short Circuit at High/Low-side 1 or 2 or 3" are set	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors more than one of the "Short Circuit at High/Low-side 1 or 2 or 3" are set	• ECU assist enabled AND • ECU is not initializing or shutting down	20ms	Type A MIL Illumination.
MD_BD_ 1_TOP.O CD_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors a single bit hs1, hs2 or hs3 is set and the respective phase feedback signal is pulled low and high by the other two phases via the motor	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors a single bit hs1, hs2 or hs3 is set and the respective phase feedback signal is pulled low and high by the other two phases via the motor	• ECU assist enabled AND • ECU is not initializing or shutting down	20ms	Type A MIL Illumination.
MD_BD_1_B OTTO M_OCD_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors a single bit ls1, ls2 or ls3 is set and the respective phase feedback signal is pulled low and high by the other two phases via the motor	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors a single bit ls1, ls2 or ls3 is set and the respective phase feedback signal is pulled low and high by the other two phases via the motor	• ECU assist enabled AND • ECU is not initializing or shutting down	20ms	Type A MIL Illumination.
MD_BD_1_TO P_S CD_FAU LT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors a single bit ls1, ls2 or ls3 is set and the respective phase feedback signal is stuck high (1)	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors a single bit ls1, ls2 or ls3 is set and the respective phase feedback signal is stuck high (1)	• ECU assist enabled AND • ECU is not initializing or shutting down	20ms	Type A MIL Illumination.
MD_BD_1_B OTTO M_SCD_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors a single bit hs1, hs2 or hs3 is set and the respective phase feedback signal is stuck low (0)	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors a single bit hs1, hs2 or hs3 is set and the respective phase feedback signal is stuck low (0)	• ECU assist enabled AND • ECU is not initializing or shutting down	20ms	Type A MIL Illumination.
MD_MOTOR_OPEN_PHASE1_FAULT	C0591	This monitor checks if: • Open Phase	d-axis and q-axis demand is compared with phase 1 measured current, if difference is less than threshold and if actual current is less then threshold, raise a fault	Low Speed Detection (0rpm..400rpm): average D-axis current errors (over last 12 samples in 200ps cycle) > 6A (ID_OPEN_PHASE_ERR_TH RESHOLD) AND maximum of phase current amplitude > 10A (PHASE_CURRENT_DIAG_ENABLE)AND last 3 samples A1 or C1 < 0.5A (ZERO CURRENT SAMPLE THRESHOLD) AND motor phase 1 current < 1A (ZERO_PHASE_CURRENT_THRESHOLD) High Speed Detection (400rpm..2400rpm): last 4 samples of Q-axis current demand > 10A (CURR DEM THRESHOLD) AND motor phase 1 current < 1A (ZERO_PHASE_CURRENT_THRESHOLD)	• NOT in Motor Open Phase Back-Up Mode AND • motor mechanical speed < 2400 rpm (MAX_MECH_SPD_OPEN_PHASE_DIAG_EN) AND • ECU assist enabled	4 counts/4ms	Type A MIL Illumination.
MD_MOTOR_OPEN_PHASE2_FAULT	C0591	This monitor checks if: • Open Phase	d-axis and q-axis demand is compared with phase 2 measured current, if difference is less than threshold and if actual current is less then threshold, raise a fault	Low Speed Detection (0rpm..400rpm): average D-axis current errors (over last 12 samples in 200ps cycle) > 6A (ID_OPEN_PHASE_ERR_TH RESHOLD) AND maximum of phase current amplitude > 10A (PHASE_CURRENT_DIAG_ENABLE)AND last 3 samples A1 or C1 < 0.5A (ZERO CURRENT SAMPLE THRESHOLD) AND motor phase 2 current < 1A (ZERO_PHASE_CURRENT_THRESHOLD) High Speed Detection (400rpm..2400rpm): last 4 samples of Q-axis current demand > 10A (CURR DEM THRESHOLD) AND motor phase 1 current < 1A (ZERO_PHASE_CURRENT_THRESHOLD)	• NOT in Motor Open Phase Back-Up Mode AND • motor mechanical speed < 2400 rpm (MAX_MECH_SPD_OPEN_PHASE_DIAG_EN) AND • ECU assist enabled	4 counts/4ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MD_MOTOR_OPEN_PHASE3_FAULT	C0591	This monitor checks if: • Open Phase	d-axis and q-axis demand is compared with phase 3 measured current, if difference is less than threshold and if actual current is less then threshold, raise a fault	Low Speed Detection (0rpm..400rpm): average D-axis current errors (over last 12 samples in 200ps cycle) > 6A (ID_OPEN_PHASE_ERR_TH RESHOLD) AND maximum of phase current amplitude > 10A (PHASE_CURRENT_DIAG_ENABLE)AND last 3 samples A1 or C1 < 0.5A (ZERO CURRENT SAMPLE THRESHOLD) AND motor phase 3 current < 1A (ZERO_PHASE_CURRENT_THRESHOLD) High Speed Detection (400rpm..2400rpm): last 4 samples of Q-axis current demand > 10A (CURR DEM THRESHOLD) AND motor phase 1 current < 1A (ZERO_PHASE_CURRENT_THRESHOLD)	• NOT in Motor Open Phase Back-Up Mode AND • motor mechanical speed < 2400 rpm (MAX_MECH_SPD_OPEN_PHASE_DIAG_EN) AND • ECU assist enabled	4 counts/4ms	Type A MIL Illumination.
MD_MOTOR_POSIT ION_SEN SOR_FAU LT	C058A	This monitor checks if: • The MPS indicates a failure or a "not normal" mode • The MPS has detected an internal problem • The SPI message has a CRC failure • The motor position data is not in the valid range	SPI error bits set during communication with MPS, or CRC error detected in SPI message.	mode_not_normal or fail bits set, incorrect CRC calculation, or invalid MPS data	• ECU is not shutting down.	5 msec	Type A. MIL Illumination.
MD_MOTOR_POS ITION_MISSING_C ALIB_F AULT	C2A1C	This monitor checks if: • Malfunctioning MPS • Unpowered MPS	The motor position sensor electrical offset calibration has failed or has not yet been completed.	• Fail if motor position calibration state = MPS_CALIB_OFF, MPS_CALIB_FAILED_VARIANCE, or MPS_CALIB_FAILED_FORWARD. • Pass if motor position calibration state = MPS_CALIB_COMPLETED	• ECU is not shutting down.	1 ms	Type A MIL Illumination.
MD_MPS_CALIB_VARIANCE_F AILED	C2A1C	This monitor checks if: • Malfunctioning MPS • Unpowered MPS	The motor position sensor electrical offset calibration has failed or has not yet been completed.	• Fail if motor position calibration state = MPS_CALIB_OFF, MPS_CALIB_FAILED_VARIANCE, or MPS_CALIB_FAILED_FORWARD. • Pass if motor position calibration state = MPS_CALIB_COMPLETED	• ECU is not shutting down.	1 ms	Type A MIL Illumination.
MD_MPS_CALIB_FORW ARD_FAILED	C2A1C	This monitor checks if: • Malfunctioning MPS • Unpowered MPS	The motor position sensor electrical offset calibration has failed or has not yet been completed.	• Fail if motor position calibration state = MPS_CALIB_OFF, MPS_CALIB_FAILED_VARIANCE, or MPS_CALIB_FAILED_FORWARD. • Pass if motor position calibration state = MPS_CALIB_COMPLETED	• ECU is not shutting down.	1 ms	Type A MIL Illumination.
MD_MOTOR_POSITION_SENSOR_EEPROM_FAULT	C058A	This monitor checks if: • Malfunctioning MPS • Unpowered MPS	• SPI error bits set during communication with EEPROM on MPS sensor, or incorrect data fingerprint found in EEPROM data read from sensor	• QSPIO-STATUS bit 3 or bit 6 are set during communication with EEPROM • EEPROM identification page[0] != 0x20 || EEPROM identification page[1] != 0x00 || EEPROM identification page[2] != 0x09	N/A	3 counts/60ms	Type A MIL Illumination.
MD_ISENSE_CROSS_C HECK_FAULT	C0582	This monitor checks if: • Current Sense Circuitry	The microcontroller shall capture M1JSENSE1 and M1JSENSE2 current samples, if average difference between M1_ISENSE1 and M1JSENSE2 over five samples is greater than RT_ISENSE_CROSS_CHECK_LIMIT, then this fault is raised and assist removed reads two independent ADC by 5 samples and averages it to measure current flow and compares, if difference is more than allowed,	The sum of the error between phase current samples (internal and external amplifier) is not in the range [-47A(MIN_ISENSE_DIFFERENCE) ...+47A (MAX_ISENSE_DIFFERENCE)] OR no new data from current sensors received	• ECU assist enabled AND • ECU is not initializing or shutting down	20 counts/80ms	Type A MIL Illumination.
MD_IEM_SEQUENCE_ERROR_FAULT	C0595	This monitor checks if: • Interrupt failure	Motor Control tasks are deemed to not be executing in the correct order. For every configured interrupt, read out any complete sequences that are in the log. For each sequence read out, the CRC is calculated for the observation points, and is compared against the expected value forthat interrupt/mode. Mode is determined from the first observation point in the sequence. A fault is raised when there is a mismatch and the CRC check is stopped forthat interrupt.	Whenever a motor interrupt is entered and exited, everytime it writes a unique number into a rolling buffer. The diagnostic calculates the CRC over complete interrupt sequences (depending on the motor state) in the buffer and raises a fault if there is a mismatch.	• ECU is not shutting down	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_CLOCK_FAIL_FAULT	C0595	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC • Bad motor	During run time Bridge Driver reports internal clock failure (using ERR line and SPI error registers).	• Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND • In register shutdown error "Internal Clock Supervision Shutdown" is set.	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE-CO NFIG_CO MP_FAU LT	C0595	This monitor checks if: • Bridge Driver incorrect operation.	To ensure correct configuraiton data is written into Bridge Driver IC. Configuration failure detection is required in order to mitigate: - Micro controller SPI failure. - Bridge Driver failure..	During initialization, if Bridge Driver state changes to CONFIG_LOCK, report config invalid fault.	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	3 counts/3ms	Type A MIL Illumination.
MD_BRIDGE_CONFIG_ERROR_FAULT	C0595	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC • Bad motor	During run time Bridge Driver reports config error (using ERR line and SPI error registers).	• Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) AND • SPI status "config valid" bit is not set AND • The fault has occurred more than once in this ignition cycle.	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_CONFIG_INVALID_FAULT	C0595	This monitor checks if: • Incorrect CRC transmitted during initialisation. • Micro controller SPI failure. • Bridge Driver failure.	During initialisation, if Bridge Driver state changes to CONFIG_LOCK, report config invalid fault.	Bridge Driver has entered the "Configuration Lock Mode" during configuration.	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	3 msec	Type A MIL Illumination.
MD_BRIDGE_CONFIG_STALLED_FAULT	C0595	This monitor checks if: • Micro controller SPI failure. • Bridge Driver failure.	Verify configuration check is completed within BRIDGE_DRV_CFG_STALLED_TIMEOUT.	Bridge Driver configuration data check was not completed within 20ms.	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	200 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MD_BRIDGE_CB_UNDER.VOLTAGE_FAULT	C0580	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC • Bad motor	During run time, the Bridge Driver reports charge pump buffer under voltage error on the CB pin of the Bridge driver ASIC (using ERR line and SPI error registers).	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND (In register shutdown error "CB undervoltage shutdown" is set AND In register internal error "CB undervoltage detection error" is set).	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_REFERENCE_VOLTAGE_FAULT	C0580	This monitor checks if: • Micro controller • Bridge Driver amplifier reference voltage ADC failure.	Verify Bridge Driver reference voltage is within limits.	HW Pin for reference voltage (IOHWAB_BRIDGE_1_REF_VOLTAGE) is not between 2.25V and 2.75V.	• ECU provides assist AND • No safe state on bridge driver	18ms/128 counts	Type A MIL Illumination.
MD_BRIDGE_3V3_UNDER.VOLTAGE_FAULT	C0580	This monitor checks if: • Bridge Driver incorrect operation.	Monitor Bridge Driver reporting under voltage error on its VCC (V3V3) pin.	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register external errors "VCC Undervoltage Detection Error" is set.	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_3V3_OVER_VOLTAGE_FAULT	C057F	This monitor checks if: • Bridge Driver incorrect operation.	Bridge Driver is reporting overvoltage on its VCC (V3V3) pin.	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register external errors "VCC Undervoltage Detection Error" is set.	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE-ERR-STUCK_LO_FAULT	C0582	This monitor checks if: • Bridge Driver ERR line connectivity • Bridge driver incorrect operation.	Check M1_BD_ERR line state.	During self test, the bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR), when Current Sense Amplifier 1&2 - Gain 2 (=BD_REG_OP_GAI_2) was set to a valid value.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	3 msec	Type A MIL Illumination.
MD_BRIDGE_VS_OVER_VOLTAGE_FAULT	C057F	This monitor checks if: • Bridge Driver incorrect operation • Battery Voltage	During run time Bridge Driver reports VS over voltage error (using ERR line and SPI error registers).	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND (In register shutdown error "Vs Overvoltage Shutdown" is set OR In register external error "Vs Overvoltage Detection Error" is set).	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_VS_UNDER.VOLTAGE_FAULT	P0562	This monitor checks if: • Low battery voltage	Bridge driver will detect undervoltage condition. The software shall interrogate the Bridge Driver to determine whether the fault is valid and if valid raises the fault.	bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register external errors "Vs Undervoltage Detection Error" is set.	• ECU provides assist AND • No safe state on bridge driver	18ms/128 counts	Type B MIL Illumination.
MD-BRIDGE-VSJUNDER.VOLTAGE_FAULT	C0580	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports VS under voltage error (using ERR line and SPI error registers), but battery voltage is greater than BD_VSU_UV_DETECT_THRESHOLD.	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register external errors "VS Undervoltage Detection Error" is set AND Battery voltage is >= 6.5V.	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_VDHP_OVER_VOLTAGE_FAULT	C057F	This monitor checks if: • Bridge Driver incorrect operation • Battery Voltage	During run time Bridge Driver reports VDHP over voltage error (using ERR line and SPI error registers).	• The voltage on the VS pin of the bridge driver ASIC is above 39.95V • Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND (In register shutdown error "VDHP Overvoltage Shutdown" is set AND In register external error "VDHP Overvoltage Detection Error" is set).	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_VDHP_UV_A_FAULT	C0580	This monitor checks if: • Excessive local temperature OR failures that cause incorrect detection of over temperature.	Data read from Bridge Driver over SPI indicates an undervoltage on the VDHP pin of the Bridge Driver ASIC.	• The voltage on the VS pin of the bridge driver ASIC is below 3.96V • Bridge driver error output pin is active IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register External errors "VDHP Undervoltage Detection Error" is set	• ECU provides assist AND • No safe state on bridge driver	18msec/ 128 counts	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MD_BRIDGE_VDHP_UV_B_FAULT	C0580	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports VDHP under voltage error (using ERR line and SPI error registers), but battery voltage is greater than BD_VDHU_UV_DETECT_THRESHOLD.	• The voltage on the VS pin of the bridge driver ASIC is below 3.96V • Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register External errors "VDHP Undervoltage Detection Error" is set AND Battery voltage is > 6.5V.	• ECU provides assist AND • No safe state on bridge driver	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_UNDEFINED_ERROR_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	During run time SPI error status flag OR Bridge ERR line is active, but no faults are reported in SPI error registers.	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set	• ECU provides assist AND • No safe state on bridge driver	1 count/1 ms	Type A MIL Illumination.
MD_BRIDGEJJ NEXPECTED_MO DE_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	Bridge Driver reports unexpected state.	Below conditions are not satisfied. ((sBridgeDriver.ICMode == BRDG_NORMAL_OPERATION) || (sBridgeDriver.State == BD_SHUTDOWN) || ((sBridgeDriver.ICMode == BRDG_ERROR_MODE) && (IOHWAB_BRIDGE_1_ERROR == ACTIVE)))	• ECU provides assist AND • No safe state on bridge driver	16 counts/ 16ms	Type A MIL Illumination.
MD_BRIDGEJJ NEXPECTED_STATE_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	Verify Bridge driver state is as expected during initialisation.	Bridge driver mode is not at the expected state during configuration.	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	3 counts / 3 ms	Type A MIL Illumination.
MD_BRIDGE_SO FF_STU CK_LO_FAULT	C0582	This monitor checks if: • M1_BD_SOFF signal not working correctly.	Check bridge driver status is reported as "normal" mode" when M1_BD_SOFF is inactive.	When bridge test pin (IOHWAB_BRIDGE_1_TEST) is driven active, bridge driver state (sBridgeDriver.State) did not change to BD_NORMAL.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	110ms	Type A MIL Illumination.
MD_BRIDGE_SPI_MSG_FAILED_FAULT	C0595	This monitor checks if: • Bridge Driver incorrect operation • Microcontroller SPI failure.	Bridge Driver reports SPI errors (using SPI error registers) OR received SPI message CRC is invalid.	("SPI error flag" is set in SPI status AND Either "Invalid Address Access", "SPI Time-out", "SPI Frame error", "SPI Time-out", "SPI CRC error" is set in SPI communication and configuraiton error register) OR Invalid SPI response is received.	Ignition State = ON OR Wake ON CAN	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_SP I_RES P_TIMEOUT_FAULT	C0595	This monitor checks if: • Incorrect low level SPI driver operation.	Verify Bridge Driver low level SPI communication is working.	Low level SPI driver is not responding.	(Ignition State = ON OR Wake ON CAN AND Battery Voltage > 6V AND Bridge Driver is not reporting under voltage	1 count/1 ms	Type A MIL Illumination.
MD_BRIDGE_REG_U NDER_VO LTAGE_FAULT	C0580	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports internal regulator under voltage error (using ERR line and SPI error registers), but battery voltage is greater than BD_IRU_UV_DETECT_THRESHOLD.	• Bridge Driver internal regulator voltage < 6.5V @1.2256V/bit • Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register internal error "Undervoltage Internal Regulator 4 or 5 or 6 Error" is set.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1 ms	Type A MIL Illumination.
MD_BRIDGE_REG1_OVER_VOLTAGE_FAULT	C057F	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports Internal regulator over voltage error (using ERR line and SPI error registers).	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register internal errors "overvoltage internal regulator 1 error" is set AND The fault has occurred only once in this ignition cycle.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1 ms	Type A MIL Illumination.
MD_BRIDGE_REG 6_OVER_VOLTAGE_FAULT	C057F	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports Internal regulator over voltage error (using ERR line and SPI error registers).	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register internal errors "overvoltage internal regulator 6 error" is set	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MD_BRIDGE_OVER_CURRENT_FAULT	C0590	This monitor checks if: • Bridge Driver incorrect operation.	Bridge Driver reporting amplifier over current errors.	IOHWAB-BRIDGEJ _ERROR is active OR in SPI status "error flag" is set AND In register current sense amplifier errors "err_oc_op1 or err_oc_op2 or err_oc_op3" are set.	EcuC. rootstat e_active == EcuC_MotorDriveOn AND DrvStg. SafeState Required == FALSE AND Battery Voltage > 6V AND Bridge Driver is not reporting under voltage	1 count/1 ms	Type A MIL Illumination.
MD_BRIDGE_OVER-TEMP_ERROR_FAULT	C05C2	This monitor checks if: • Excessive local temperature OR failures that cause incorrect detection of over temperature.	During run time Bridge Driver reports over temperature error (using SPI error registers).	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register shutdown error "Overtemperature Shutdown" is set.	• ECU provides assist AND • No safe state on bridge driver	1 count/1 ms	Type A MIL Illumination.
MD_BRIDGE_OSF_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports output stage feedback failure (using ERR line and SPI error registers).	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register for output stage feedback errors any error is set	• ECU provides assist AND • No safe state on bridge driver	1 count /1ms	Type A MIL Illumination.
MD_BRIDGE_ECC_FAIL_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports ECO failure (using SPI error registers).	Special event register of bridge driver indicates that error correction of control register failed AND The fault has occurred more than once in this ignition cycle.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_HS_OVER_VOLTAGE_FAULT	C057F	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports high side capacitor over voltage error (using ERR line and SPI error registers).	• Bridge Driver highside capacitor voltage < 6.5V @1/256V/bit • Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register internal error "High-side Buffer Capacitor 1 or 2 or 3 Overvoltage Detection Error" is set.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_HS_UNDER_VOLTAGE_FAULT	C0580	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports high side capacitor under voltage error (using ERR line and SPI error registers), but battery voltage is greater than BD_HBCU_UV_DETECT_THRESHOLD.	• Bridge Driver highside capacitor voltage < 6.5V @1/256V/bit • Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register internal error "High-side Buffer Capacitor 1 or 2 or 3 Undervoltage Detection Error" is set.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_NOT_DISABLED_FAULT	C0582	This monitor checks if: • Bridge Driver enable signal connectivity.	The microprocessor shall test that when M1_BD_ENA (bridge driver enable) is inactive, motor FETs can not be driven.	Set bridge driver HW enable Pin (IOHWAB_BRIDGE_1 -ENABLE) inactive and set all three bottom FETs ON. After 100us all bottom FETS were not disabled.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	39 ms	Type A MIL Illumination.
MD_BRIDGE_LATENT_WARNING_EVENT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	The BD has reported a 'latent fault' (over SPI)	In SPI status "SPI special event" is set AND In special events register "SPI Latent Fault Warning" is set.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_NOT_ENABLED_FAULT	C0582	This monitor checks if: • Bridge Driver enable signal connectivity.	The microprocessor shall test that when M1_BD_ENA (bridge driver enable) is active motor FETs can be driven.	Set bridge driver HW enable Pin (IOHWAB_BRIDGE_1_ENABLE) active with all three bottom FETS already ON. After 100us even one bottom FET was not enabled.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	29 msec	Type A MIL Illumination.
MD_BRIDGE-CP_OVER_VOLTAGE_FAULT	C057F	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports charge pump over voltage error (using ERR line and SPI error registers).	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register external error "charge pump overvoltage detection error" is set.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_CP1_OVERLOAD_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports CP1 overload error (using ERR line and SPI error registers).	Special event register of bridge driver indicates that error correction of control register failed AND (In register internal errors "Charge Pump 1 Overload Error" is set OR In register shutdown errors "Vs Path Charge Pump Input Overload" is set).	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MD_BRIDGE_CP2_OVERLOAD_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports CP2 overload error (using ERR line and SPI error registers).	Special event register of bridge driver indicates that error correction of control register failed AND (In register internal errors "Charge Pump 2 Overload Error" is set	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_DDP_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	During run time Bridge Driver reports digital driving path failure (using ERR line and SPI error registers).	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register shutdown error "Digital Driving Path Stocked Shutdown" is set.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_DRV_B IST_CB_UV_FAULT	C0580	This monitor checks if: • Bridge Driver incorrect operation.	Perform Bridge driver charge pump buffer (CB) under voltage self test.	When Bridge Driver was put into CB under voltage self test mode and after 5msec, bridge driver error output pin was not active (IOHWAB_BRIDGE_1_ERROR)	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	85 ms	Type A MIL Illumination.
MD_BRIDGE_DRV_B IST_CSA_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	Perform Bridge driver amplifier gain BIST.	When Bridge Driver was put into CSA Gain self test mode, Bridge driver error output pin is not active (IOHWAB_BRIDGE_1_ERROR) OR Isense reading was not within limits.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	100 ms	Type A MIL Illumination.
MD_BRIDGE_DRV_B IST_CSA_VRO_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	Perform Bridge driver CSAVRO BIST.	When Bridge Driver was put into CSA VRO self test and self test was finished, one of the CSA 1/2/3 supply over voltage/under voltage error bit was not set.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	170 ms	Type A MIL Illumination.
MD_BRIDGE_DRV_BIST_SHORT_CCT_FAULT	C0582	This monitor checks if: • Bridge Driver short circuit detection not working.	Bridge driver built in high/low side short circuit detection test.	When Bridge Driver was put into short circuit test mode and FET was driven, bridge driver error output pin was not active (IOHWAB_BRIDGE_1_ERROR) OR Short circu it error bits were not set in register OR High-side 1/2/3 Drain Source Measurement were not at expected value.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	180 ms	Type A MIL Illumination.
MD_BRIDGE_DRV_BIST_TIMEOUT_FAULT	C0582	This monitor checks if: • Bridge Driver BIST not working correctly.	Built-in selftest timeout.	Bridge Driver built in self test was not completed within 100msec.	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	1 count/1ms	Type A MIL Illumination.
MD_BRIDGE_DRV_BIST_VCC_F AULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	Perform Bridge Driver's VCC built in self test.	When Bridge Driver was put into VCC self test mode, bridge driver error output pin was not active (IOHWAB_BRIDGE_1_ERROR) OR VCC under voltage error bit was not set in external error register	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	2 counts/50ms	Type A MIL Illumination.
MD_PU_BRIDG E_DRV_I NHIBIT.FAULT	C0582	This monitor checks if: • Bridge Driver inhibit signal connectivity • Bridge Driver incorrect operation.	Verify Bridge Driver will be in SLEEP mode, if Bridge driver is inhibited.	When HW inhibit Pin (IOHWAB_BRIDGE_1_INHIBIT) is active, the bridge driver operation mode register did not indicate that it is in the expected Sleep Mode.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	20ms	Type A MIL Illumination.
MD_PU_BR IDGE-DRV.W AKE_U P_F AULT	C0582	This monitor checks if: • Bridge Driver inhibit signal connectivity • Bridge Driver incorrect operation.	Remove Bridge inhibit and verify SPI comms is started and Bridge Driver state changes to IDLE.	When HW inhibit Pin (IOHWAB_BRIDGE_1_INHIBIT) is driven inactive, the bridge driver operation mode register did not transit from Sleed Mode to the expected Idle Mode.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	20ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MD_MOTOR_D BL_OPEN_PH ASE_FAULT_BRIDG E_O NE	C0580	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	All phase currents of last 4 samples were below 1A (ZERO_PHASE_CURRENT_THRESHOLD)	All phase currents of last 4 samples were below 1A (ZERO_PHASE_CURRENT_THRESHOLD)	Motor mechanical speed is below threshold AND last 4 Q-Axis current demand samples are above threshold AND ECU assist enabled Note: If the Q-axis current demand drops below CURR_DEM_THRESHOLD the qualification counters preserve their values (so they are not reset).	38ms	Type A MIL Illumination.
MD_ZERO_PHASE_CURRENT_FAULT_BRIDGE_ONE	C0590	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Raised when at low motor speed the current of all three motor phases of bridge 1 is lower than expected. - motor speed is low - q-axis current demand is above a threshold - stator voltage demand is saturated - all phase currents are very small	Q-axis current demand > 10A (ZOO QAXIS CURRENT DEMAND) AND maximum phase current amplitude < 0.75 (ZCO PHASE CURRENT RATIO) x Q-axis current demand AND normalized voltage demand squared > 0.81 V (ZCO MIN VOLT DEMAND SQUARE)	motor mechanical speed is low AND ECU assist enabled	100ms	Type A MIL Illumination.
MD_PU_BD 1_SOF F_MO N_STU CK_LO_F AULT	C0582	This monitor checks if:	When HW pin for shut off (IOHWAB_BRIDGE_1_SOFF) is driven inactive, bridge driver state (sBridgeDriver.State) did change to BD_NORMAL, but monitoring SOFF HW Pin (IOHWAB_M1_BD_SOFF_MON) did not become inactive.	When HW pin for shut off (IOHWAB_BRIDGE_1_SOFF) is driven inactive, bridge driver state (sBridgeDriver.State) did change to BD_NORMAL, but monitoring SOFF HW Pin (IOHWAB_M1_BD_SOFF_MON) did not become inactive.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	n/a	Type A MIL Illumination.
MD_PU_BD 1_SOF F_MO N_STU CK_HI_FAULT	C0582	This monitor checks if:	When HW pin for shut off (IOHWAB_BRIDGE_1_SOFF) is active, Bridge Driver does not indicate the Safe Off State (SOFF) in Operation Mode Overview register OR HW input pin from bridge driver (IOHWAB_M1_BD_SOFF_MON) is inactive.	When HW pin for shut off (IOHWAB_BRIDGE_1_SOFF) is active, Bridge Driver does not indicate the Safe Off State (SOFF) in Operation Mode Overview register OR HW input pin from bridge driver (IOHWAB_M1_BD_SOFF_MON) is inactive.	Battery voltage between 7.1vand 18v AND Motor rotating below +/-8.3mrev/s	n/a	Type A MIL Illumination.
MD_PU_BD 1_AUTO_CALIB_FAILED_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	Bridge driver reports that autocalibration failed.	Bridge driver reports that autocalibration failed.	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	n/a	Type A MIL Illumination.
MD_PU_BD1_AUTO_CALIB_TIMEOUT_FAULT	C0582	This monitor checks if: • Bad Motor Driver Circuit • Bad motor driver ASIC	10 ms timeout waiting for bridge driver autocalibration.	Bridge driver autocalibration time> 10 ms	Battery voltage between 7.1 v and 18v AND Motor rotating below +/-8.3mrev/s	n/a	Type A MIL Illumination.
MD_BRIDGE_SHORT_CIRCUIT_FAULT	C0582	This monitor checks if: • Bridge Driver incorrect operation.	This failsafe checks the SPI communication from the bridge driver to see if it is reporting a short circuit fault. This failsafe operates at run-time	Bridge driver error output pin is active (IOHWAB_BRIDGE_1_ERROR) OR the SPI status "error flag" is set AND In register Short Circuit Errors any of the "Short Circuit at High/Low-side 1 or 2 or 3" are set.	• ECU provides assist AND • No safe state on bridge driver Note: ECU provides assist includes that the measured battery voltage is above 6V and that there is no undervoltage reported from the bridge driver internal voltage monitoring.	3 msec	Type A MIL Illumination.
MOTOR_DEMAG_WARN	C05C2	This monitor checks if: Motor magnet over temperature.	Motor magnet temperature is greater than threshold.	Sets when the estimated motor magnet temperature is > 140°C	Power ON, Continuous Failsafing	5 msec	Type A MIL Illumination.
MOTOR_DEMAG_FAIL	C05C2	This monitor checks if: Motor magnet over temperature.	Motor magent temperature is greater than threshold.	Sets when the estimated motor magnet temperature is > 160°C	Power ON, Continuous Failsafing	20 msec	Type A MIL Illumination.
MOTOR_OVER_TE MP_WARN	C05C2	This monitor checks if: Motor winding over temperature.	Motor winding temperature is greater than threshold.	Sets when the estimated motor winding temperature is > 210°C	Power ON, Continuous Failsafing	20 msec	Type A MIL Illumination.
MOTOR_OVER_TE MP_FAIL	C05C2	This monitor checks if: Motor winding over temperature.	Motor winding temperature is greater than threshold.	Sets when the estimated motor winding temperature is > 240°C	Power ON, Continuous Failsafing	20 msec	Type A MIL Illumination.
MOTOR_FET_OVE R_TEMP_WARN	C05C2	This monitor checks if: Motor FET over temperature.	Motor FET temperature is greater than threshold.	Sets when the estimated motor FET temperature is > 135°C	Power ON, Continuous Failsafing	20 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MOTOR_FET_OVE R_TEMP_FAIL	C05C2	This monitor checks if: Motor FET over temperature.	Motor FET temperature is greater than threshold.	Sets when the estimated motor FET temperature is > 150°C	Power ON, Continuous Failsafing	20 msec	Type A MIL Illumination.
Group 8 - Brake Hydraulic Monitor							
Group 10 - Ground Monitor							
Group 11 - Switches							
BRAKE_FLU ID_LEVEL_SW_FAU LTED	C0678	This monitor checks if: • Anything that causes the fluid level feedback to fail • Wiring (open circuit) • Wiring (Short to battery)	• The Brake Fluid Level switch is a hardwired input to the EBCM. Whenever the voltage level is above the threshold, the failure timer will be triggered.	Brake Fluid Level feedback voltage > 90% of battery voltage	• Power ON, Continuous Failsafing	1s	Type A MIL Illumination.
BRAKE_FLU ID_LEVEL_SW_O PEN_CIRCUIT	C0677	This monitor checks if: • Anything that causes the fluid level feedback to fail • Wiring (open circuit)	• The Brake Fluid Level switch is a hardwired input to the EBCM. Whenever the voltage level is above the threshold, the failure timer will be triggered.	Brake Fluid Level feedback voltage > 90% of battery voltage	• Power ON, Continuous Failsafing	1s	Type A MIL Illumination.
BRAKE_FLU ID_LEVEL_SW_SHORTED_TO_GND	C0676	This monitor checks if: • Anything that causes the fluid level feedback to fail • Wiring (open circuit)	• The Brake Fluid Level switch is a hardwired input to the EBCM. Whenever the voltage level is above the threshold, the failure timer will be triggered.	Brake Fluid Level feedback voltage > 90% of battery voltage	• Power ON, Continuous Failsafing	1s	Type A MIL Illumination.
Group 12 - Pressure Sensor							
SCP1_CORRELATION_ERROR	C0574	This monitor checks if: SCP1 signal failure	The SCP1.SCP2 and PTS sensor signals are used to compare and identify a single failed sensor signal. This fault is set if the difference exceeds the error threshold value.	|SCP_1 - SOP--2| > 5 Bar	Input signals valid for some time (allow system/signal to initialize)	125-500 ms 18000 Counts	Type A MIL Illumination.
SCP2_CORRELATION_ERROR	C0574	This monitor checks if: SCP2 signal failure	The SCP1.SCP2 and PTS sensor signals are used to compare and identify a single failed sensor signal. This fault is set if the difference exceeds the error threshold value.	|SCP_1 - SOP--2| > 5 Bar	Input signals valid for some time (allow system/signal to initialize)	125-500 ms 18000 Counts	Type A MIL Illumination.
SCP1_OFFSET_ERROR	C0574	This monitor checks if: SCP1 signal failure	The offset required to zero the Secondary circuit pressure sensor is larger than the specification limit.	|SCP_1_Off| > 10 Bar	The fault itself does not have much enable condition. Whenever an offset is learned, it is checked for result. To allow the learning, vehicle faster than some speed, vehicle accelerating, driver not on brake,	100 ms Goal: 18000	Type A MIL Illumination.
SCP2_OFFSET_ERROR	C0574	This monitor checks if: SCP2 signal failure	The offset required to zero the Secondary circuit pressure sensor is larger than the specification limit.	|SCP_2_Off| > 10 Bar	The fault itself does not have much enable condition. Whenever an offset is learned, it is checked for result. To allow the learning, vehicle faster than some speed, vehicle accelerating, driver not on brake,	100 ms Goal: 18000	Type A MIL Illumination.
BP_MO DEL_TOO_HIGH_ERROR	C053D	This monitor checks if: Common cause Boost Pressure Sensor failure (in-range high)	The system models an expected boost pressure based on motor position change. This fault indicates that the boost pressure sensor indicates higher pressure than predicted by the model and than evidenced by the vehicle deceleration.	• Valid braking request (driver or autonomous) • BP_Model (MPS) < Boost pressure - 50 Bar • Vehicle deceleration is not observed	• Signal valid; • No ABS; • vehicle at speed and is slowing down. • driver not on throttle and requested enough pressure	500 ms Goal: 18000	Type A MIL Illumination.
BP_MO DEL_TO O_LO W_ERRO R	C053D	This monitor checks if: Common cause Boost_P failure (in-range-low)	The system models an expected boost pressure based on motor position change. This fault indicates that the boost pressure sensor indicates lower pressure than predicted by the model and than evidenced by the vehicle deceleration.	• Valid braking request (driver or autonomous) • BP_Model (MPS) > Boost pressure + 5 Bar • Vehicle deceleration is observed	• Signal valid; • No ABS; • DAP close to end position; • vehicle at speed not slowing down much; • driver not on throttle and requested enough pressure	500 ms Goal: 18000	Type A MIL Illumination.
BP1_CORRELATION_ERROR	C053D	This monitor checks if: BP1 signal failure	The BP1, BP2, and DAP position signals are used to compare and identify a single failed sensor signal	|Boost_P_1 - Boost_P_2| > 5 Bar	Input signals valid for some time (allow system/signal to initialize)	125-500 ms 18000 Counts	Type A MIL Illumination.
BP2_CORRELATION_ERROR	C053D	This monitor checks if: BP2 signal failure	The BP1, BP2, and DAP position signals are used to compare and identify a single failed sensor signal	|Boost_P_1 - Boost_P_2| > 5 Bar	Input signals valid for some time (allow system/signal to initialize)	125-500 ms 18000 Counts	Type A MIL Illumination.
BP_RAW_OFFSET_E RROR	C053D	This monitor checks if: Boost Pressure Sensor Failure	The offset required to zero the Boost Pressure sensor is larger than the specification limit of 50 bar.	|BP_RAW_Off| > 50 BAR	• Input signal valid; • Driver request, DAP position, suggest there should be no pressure; • Vehicle acceleration, vehicle at speed.	500 ms Goal: 18000	Type A MIL Illumination.
BP1_OFFSET_ERROR	C053D	This monitor checks if: BP1 signal failure	The offset required to zero the Boost Pressure sensor is larger than the specification limit	|BOOST_P_1_ Off| > 10 Bar	The fault itself does not have much enable condition. Whenever an offset is learned, it is checked for result. To allow the learning, vehicle faster than some speed, vehicle accelerating, driver not on brake.	100 ms Goal: 18000	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
BP2_OFFSET_ERROR	C053D	This monitor checks if: BP2 signal failure	Tbe offset required to zero the Boost Pressure sensor is larger than the specification limit	|BOOST_P_2_Off| > 10 Bar	The fault itself does not have much enable condition. Whenever an offset is learned, it is checked for result. To allow the learning, vehicle faster than some speed, vehicle accelerating, driver not on brake.	100 ms Goal: 18000	Type A MIL Illumination.
IPT_BST_CIRC_MULTIPLE--ERROR	C053D	This monitor checks if: • Intermittent failure of the pressure sensor. • Intermittent open or short in the internal circuitry of the printed circuit board.	• Pressure Sensor Erratic • This diagnostic checks both raw Boost Pressure principle and reference signals.	Ohmic Status Faulted = Sensor open or shorted to sensor supply (conditions for MC_PRES--SEN--OPEN--OR_SHRT--HIGH) or Sensor shorted to ground (conditions for MC_PRES_SEN_SHORTED_LOW) Fault counts toward setting each time Ohmic Faulted status changes from Passed to Faulted or from Faulted to Passed.	• Sensor voltage supply in range • Boost Pressure Sensor is enabled	80 ms Goal: 800	Type A MIL Illumination.
SC_PRES_SEN_ERRATIC	C0574	This monitor checks if: • Intermittent failure of the pressure sensor. • Intermittent open or short in the internal circuitry of the printed circuit board.	• Pressure Sensor Erratic • This diagnostic checks both raw Boost Pressure principle and reference signals.	Ohmic Status Faulted = Sensor open or shorted to sensor supply (conditions for SC_PRES--SEN--OPEN--OR_SHRT--HIGH) or Sensor shorted to ground (conditions for SC_PRES_SEN_SHORTED_LOW) Fault counts toward setting each time Ohmic Faulted status changes from Passed to Faulted or from Faulted to Passed.	• Sensor voltage supply in range • Secondary Circuit Pressure Sensor is enabled	80 ms Goal: 800	Type A MIL Illumination.
PRESSURE--SENSOR_MISSING_CALIBRATION	C0560	This monitor checks if: • Missing Calibration • NVRAM error	Ibis fault only checks if the EOL calibration is sucessful or not. If the calibration was not yet done or if the calibration is not successful, then this fault is set. The NVRAM contains both calibrated offset and status, but only the status is checked to set the fault.	status != SUCCESSFUL	Any time after system wake up and read NVRAM	500 ms Goal:18000	Type A MIL Illumination.
PRESS_SENS_1_COMM_FAULT	C2A15	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	Tbe periodically incoming fast messages of pressure sensor 1 are checked. If one of the following errors appear the fault is detected: No message received for the last 5ms. CRC of a message is invalid. A nibble value of the message is invalid. Tbe number of received nibbles for a message is invalid. Tbe synchronisation with the pressure sensor failed. Tbe inverted most significant nibble does not match with the most significant nibble.	If there is lost frames or no message received, FaultCount add by 1. If faulty frame detected by the SENT driver, FaultCount add by 1. Fault sets if FaultCount is not 0.	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.
PRESS_SENS_1_FAST_DATA_FAULT	C2A15	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	Tbe periodically incoming fast messages of pressure sensor 1 are checked. If one of the following errors appear the fault is detected: No message received for the last 5ms. CRC of a message is invalid. A nibble value of the message is invalid. Tbe number of received nibbles for a message is invalid. Tbe synchronisation with the pressure sensor failed. Tbe inverted most significant nibble does not match with the most significant nibble.	If there is lost frames or no message received, FaultCount add by 1. If faulty frame detected by the SENT driver, FaultCount add by 1. Fault sets if FaultCount is not 0.	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.
PRESS_SENS--1_OUT_OF_RANGE_LOW	C053E	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	Tbe periodically incoming fast messages of pressure sensor 1 are checked. If one of the following errors appear the fault is detected: No message received for the last 5ms. CRC of a message is invalid. A nibble value of the message is invalid. Tbe number of received nibbles for a message is invalid. Tbe synchronisation with the pressure sensor failed. Tbe inverted most significant nibble does not match with the most significant nibble.	sensor output raw signal is < -6 bar	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.
PRESS_SENS--1_OUT_OF_RANGE_HIGH	C053F	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	Tbe periodically incoming fast messages of the pressure sensor 1 are checked. If none of the following errors appear, FaultCount is 0 and the fault is passed: No message received for the last 5ms.CRC of a message is invalid. A nibble value of the message is invalid.The number of received nibbles for a message is invalid. Tbe syncronisation with the vacuum sensor failed. Tbe inverted most significant nibble does not match with the most significant nibble. Boost IPT OOR_High low bound threshold (in raw digital value), indicating 250BAR, only when IPT output is < 250BAR to clear the fault.	sensor output raw signal is > 250 bar	Anytime while system is awake Pressure sensor supply enabled	400 ms	Type A MIL Illumination.
PRESS--SENS--1_SERIAL_MSG_FAULT	C2A15	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	Tbe periodically incoming fast messages of pressure sensor 1 are checked. If one of the following errors appear the fault is detected: No message received for the last 5ms. CRC of a message is invalid. A nibble value of the message is invalid. Tbe number of received nibbles for a message is invalid. Tbe synchronisation with the pressure sensor failed. Tbe inverted most significant nibble does not match with the most significant nibble.	If there is lost frames or no message received, FaultCount add by 1. If faulty frame detected by the SENT driver, FaultCount add by 1. Fault sets if FaultCount is not 0.	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.
PRESS--SENS--2_COMM--FAULT	C2A16	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	Tbe periodically incoming fast messages of pressure sensor 1 are checked. If one of the following errors appear the fault is detected: No message received for the last 5ms. CRC of a message is invalid. A nibble value of the message is invalid. Tbe number of received nibbles for a message is invalid. Tbe synchronisation with the pressure sensor failed. Tbe inverted most significant nibble does not match with the most significant nibble.	If there is lost frames or no message received, FaultCount add by 1. If faulty frame detected by the SENT driver, FaultCount add by 1. Fault sets if FaultCount is not 0.	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.
PRESS_SENS_2_FAST_DATA_FAULT	C2A16	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	Tbe periodically incoming fast messages of pressure sensor 1 are checked. If one of the following errors appear the fault is detected: No message received for the last 5ms. CRC of a message is invalid. A nibble value of the message is invalid. Tbe number of received nibbles for a message is invalid. Tbe synchronisation with the pressure sensor failed. Tbe inverted most significant nibble does not match with the most significant nibble.	If there is lost frames or no message received, FaultCount add by 1. If faulty frame detected by the SENT driver, FaultCount add by 1. Fault sets if FaultCount is not 0.	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
PRESS_SENS_2_OUT_OF_RANGE_LOW	C0571	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	The periodically incoming fast messages of pressure sensor 1 are checked. If one of the following errors appear the fault is detected: No message received for the last 5ms. CRC of a message is invalid. A nibble value of the message is invalid. The number of received nibbles for a message is invalid. The synchronisation with the pressure sensor failed. The inverted most significant nibble does not match with the most significant nibble.	sensor output raw signal is < -6 bar	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.
PRESS_SENS_2_OUT_OF_RANGE_HIGH	C0572	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	The periodically incoming fast messages of the pressure sensor 1 are checked. If none of the following errors appear, FaultCount is 0 and the fault is passed: No message received for the last 5ms.CRC of a message is invalid. A nibble value of the message is invalid.The number of received nibbles for a message is invalid. The syncronisation with the vacuum sensor failed. The inverted most significant nibble does not match with the most significant nibble. Boost IPT OOR_High low bound threshold (in raw digital value), indicating 250BAR, only when IPT output is < 250BAR to clear the fault.	sensor output raw signal is > 306 bar	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.
PRESS—SENS—2_SERIALMSG—FAULT	C2A16	This monitor checks if: Electrical fault in sensor. Mechanical fault in sensor. Open or shorted signal line.	The periodically incoming fast messages of pressure sensor 1 are checked. If one of the following errors appear the fault is detected: No message received for the last 5ms. CRC of a message is invalid. A nibble value of the message is invalid. The number of received nibbles for a message is invalid. The synchronisation with the pressure sensor failed. The inverted most significant nibble does not match with the most significant nibble.	If there is lost frames or no message received, FaultCount add by 1. If faulty frame detected by the SENT driver, FaultCount add by 1. Fault sets if FaultCount is not 0.	Anytime while system is awake Pressure sensor supply enabled	100 ms	Type A MIL Illumination.
Group 13 - Vacuum Sensor							
Group 14 - Steering Angle Sensor							
Group 15 - Lateral Acceleration Sensor							
Group 16 - Longitudinal Acceleration Sensor							
Group 17 - Yaw Rate Sensor							
Group 18 - Pedal Travel Sensor							
PTS—TO_SOP—MODEL—TOO—HIGH—ERROR	C05D2	This monitor checks if: • Master cylinder seal leakage to reservoir • Pedal Simulator seal leakage to reservoir • In-range failure of SCP sensor	The BHS function includes a model of expected simulator Pressure based on driver pedal position. MODEL_TOO_HIGH_ERROR detects the situation where the modeled pressure is much higher than the measured pressure. Given certain travel, some amount of minimun pressure is expected in the SC. Otherwise something is wrong.	BHS modeled pressure > SCP Measured Pressure + 20 Bar Look up table (add lookup table to appendices)	PTS > the minimum point on the lookup table	500 ms 18000 Counts	Type A MIL Illumination.
PTS—TO_SOP—MODEL—TOO—LOW—ERROR	C05D3	This monitor checks if: • Pedal Simulator Valve is closed or blocked • Pedal Simulator seized/fails to store fluid • In-range failure of SCP sensor	The BHS function includes a model of expected simulator Pressure based on driver pedal position. MODEL_TOO_LOW_ERROR detects the situation where the modeled pressure is much lower than the measured pressure.	BHS modeled pressure < SCP Measured Pressure - 20 Bar	The brake event is not a fast apply (which may cause unpredictable high pressure)	500 ms 18000 Counts	Type A MIL Illumination.
PTS1_OUT_OF_RANGE_ERROR	C05CC	This monitor checks if: •Failure of PTS1 • Failure of travel sensor cursor rod	During normal operation the input piston travel is physically limited to -25 mm, and during NO_BOOST operation it is limited to -36 mm. The sensor is capable of measuring travel up to 43 mm. Reported travel by a single sensor in excess of these limits is indicative of a sensor error.	• PTS1 signal > 38 mm AND • PTS2 signal and SCP signal agree that actual travel is in range Not checking for SCP	Signal is valid	5 s 18000 Counts	Type A MIL Illumination.
PTS2_OUT_OF_RANGE_ERROR	C05CF	This monitor checks if: •Failure of PTS2 • Failure of travel sensor cursor rod	During normal operation the input piston travel is physically limited to -25 mm, and during NO_BOOST operation it is limited to -36 mm. The sensor is capable of measuring travel up to 43 mm. Reported travel by a single sensor in excess of these limits is indicative of a sensor error.	• PTS2 signal > 38 mm AND • PTS1 signal and SCP signal agree that actual travel is in range Not checking for SCP	Signal is valid	5 s 18000 Counts	Type A MIL Illumination.
PTS1_STEP_ERROR	C05CC	This monitor checks if: • Failure of PTS1 signal line	The PTS1 sensor signal changes at a physically implausible rate, resulting in a signal that disagrees with PTS2 signal, and a modeled pressure that disagrees with the SCP (i.e. PTS2 model and SCP signals agree on driver braking level, PTS1 model and SCP disagree)	• PTS1 signal gradient > 700 mm/s • |PTS1 - PTS2| > Errorthreshold • Model(PTS1) != SCP and Model(PTS2) == SCP	Signal is valid	50 ms Goal: 10 Counts	Type A MIL Illumination.
PTS2_STEP_ERROR	C05CF	This monitor checks if: • Failure of PTS2 signal line	The PTS2 sensor signal changes at a physically implausible rate, resulting in a signal that disagrees with PTS1 signal, and a modeled pressure that disagrees with the SCP (i.e. PTS1 model and SCP signals agree on driver braking level, PTS2 model and SCP disagree)	• PTS2 signal gradient > 700 mm/s • |PTS1 - PTS2| > Errorthreshold • Model(PTS2) != SCP and Model(PTS1) == SCP	Signal is valid	50 ms Goal: 10 Counts	Type A MIL Illumination.
PTS1_CORRELATION_ERROR	C05D0	This monitor checks if: PTS1 Signal Failure	The PTS1, PTS2, and BAS sensor signals are used in a 2-out-of-3 correlation scheme to identify a single failed sensor signal	• |PTS1 - PTS2| > 2 mm AND • |PTS1 - BAS| > 2 mm AND • |PTS2 - BAS| < 2 mm	Signal is valid	125-500 ms 18000 Counts	Type A MIL Illumination.
PTS2_CORRELATION_ERROR	C05D0	This monitor checks if: PTS1 Signal Failure	The PTS1, PTS2, and BAS sensor signals are used in a 2-out-of-3 correlation scheme to identify a single failed sensor signal	• |PTS1 - PTS2| > 2 mm AND • |PTS1 - BAS| > 2 mm AND • |PTS2 - BAS| < 2 mm	Signal is valid	125-500 ms 18000 Counts	Type A MIL Illumination.
PTS_MISSING_CALIBRATION_ERROR	C05D4	This monitor checks if: • Missing Calibration • NVRAM error • ECU/ACU mismatch	The PTS calibrations are stored in NVRAM and reused at the start of each drive cycle. This fault sets if the stored calibrations doesn't show BHS_PTS_CALIB_WAY_SUCCESSFUL.	None	After system start up and read from NVRAM	30 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
PTS_FAILURE_TO_CONFIRM_CORRECT_SENSOR	C05D4	This monitor checks if: • Missing Calibration • Invalid Calibration • NVRAM error • ECU/ACU mismatch	The PTS calibrations are stored in NVRAM and reused at the start of each drive cycle. This fault sets if the stored calibrations don't match the values reported by the PTS sensor or if the calibrations are invalid or both PTS_SENS1_SERIAL_DATA_MSG_FAULT & PTS_SENS1_SERIAL_DATA_MSG_FAULT set	None	After system start up and read from NVRAM	1 count / 1ms	Type A MIL Illumination.
PTS1_OFFSET_ERROR	C05CC	This monitor checks if: • defective sensor • mechanical mounting of the sensor	Tbe offset required to zero the PTS sensor is larger than the specification limit.	|PTS1 Offset| > 2.5 mm	The fault itself does not have much enable condition. Whenever an offset is learned, it is checked for result. To allow the learning, vehicle faster than some speed, vehicle accelerating, driver not on brake.	100ms Goal: 18000	Type A MIL Illumination.
PTS2_OFFSET_ERROR	C05CF	This monitor checks if: • defective sensor • mechanical mounting of the sensor	Tbe offset required to zero the PTS sensor is larger than the specification limit.	|PTS2 Offset| > 2.5 mm	The fault itself does not have much enable condition. Whenever an offset is learned, it is checked for result. To allow the learning, vehicle faster than some speed, vehicle accelerating, driver not on brake.	100ms Goal: 18000	Type A MIL Illumination.
PTS_SENS1_COMMUNICATION_FAULT	C2A13	This monitor checks if: • defective sensor • mechanical mounting of the sensor	General PTS1 SENT frame issue according to SAE J2716: • Missing message • Stuck data • Calibration pulse length error • Unexpected number of falling edges between calibration pulses • Checksum error • Any nibble data values measured out of range • Successive calibration pulse variation too high • Ratio of calibration pulse to message length variation too high	None	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS1_STATUS_SIGNAL1_INVALID	C2A13	This monitor checks if: • defective sensor • mechanical mounting of the sensor	PTS1 SENT channel has 2 error bits. This fault is set if either error bit has a value of 1.	None	After system start up	100 msec	Type A MIL Illumination.
PTS1_PLATEAU_IMPOSSIBLE_STATE	C05D0	This monitor checks if: • defective sensor • defective magnets • mechanical mounting of the sensor	Tbe PTS1 plateau detection has a boolean table calculation based on several inputs & outputs. There are several states that are not possible, based on the preconditions of each signal (conflicting inputs). This fault is set if an impossible state is entered.	None	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS1_STATUS_SIGNAL2_INVALID	C2A13	This monitor checks if: • defective sensor • mechanical mounting of the sensor	PTS1 SENT slow channel has an error & status frame with ID 01 Hex. This fault is set if an error code is indicated.	None	After system start up	100 msec	Type A MIL Illumination.
PTS2_PLATEAU_IMPOSSIBLE_STATE	C05D0	This monitor checks if: • defective sensor • defective magnets • mechanical mounting of the sensor	Tbe PTS2 plateau detection has a boolean table calculation based on several inputs & outputs. There are several states that are not possible, based on the preconditions of each signal (conflicting inputs). This fault is set if an impossible state is entered.	None	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS1_SIG1_OOR_HIGH_ERROR	C05CA	This monitor checks if: • defective sensor	PTS1 12-bit pedal travel signal on SENT1 channel is too high, out of range.	Pedal travel signal > 4088	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS1_SIG1_OOR_LOW_ERROR	C05CB	This monitor checks if: • defective sensor	PTS1 12-bit pedal travel signal on SENT1 channel is too low, out of range.	Pedal travel signal = 0	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS1_SIG2_OOR_HIGH-ERROR	C05CA	This monitor checks if: • defective sensor	PTS1 12-bit pedal travel strength signal on SENT1 channel is too high, out of range.	Strength signal > 4088	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS1_SIG2_OOR_LOW_ERROR	C05CB	This monitor checks if: • defective sensor	PTS1 12-bit pedal travel strength signal on SENT1 channel is too low, out of range.	Strength signal = 0	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS2_COMMUNICATION_FAULT	C2A14	This monitor checks if: • defective sensor • mechanical mounting of the sensor	General PTS2 SENT frame issue according to SAE J2716: • Missing message • Stuck data • Calibration pulse length error • Unexpected number of falling edges between calibration pulses • Checksum error • Any nibble data values measured out of range • Successive calibration pulse variation too high • Ratio of calibration pulse to message length variation too high	None	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS2_STATUS_SIGNAL1_INVALID	C2A14	This monitor checks if: • defective sensor • mechanical mounting of the sensor	PTS2 SENT channel has 2 error bits. This fault is set if either error bit has a value of 1.	None	After system start up	100 msec	Type A MIL Illumination.
PTS_SENS2_STATUS_SIGNAL2_INVALID	C2A14	This monitor checks if: • defective sensor • mechanical mounting of the sensor	PTS2 SENT slow channel has an error & status frame with ID 01 Hex. This fault is set if an error code is indicated.	None	After system start up	100 msec	Type A MIL Illumination.
PTS_SENS2_SIG1_OOR_HIGH_ERROR	C05CD	This monitor checks if: • defective sensor	PTS2 12-bit pedal travel signal on SENT2 channel is too high, out of range.	Pedal travel signal > 4088	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS2_SIG1_OOR_LOW_ERROR	C05CE	This monitor checks if: • defective sensor	PTS2 12-bit pedal travel signal on SENT2 channel is too low, out of range.	Pedal travel signal = 0	After system start up	50 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
PTS_SENS2_SIG2_OOR_HIGH_ERROR	C05CD	This monitor checks if: • defective sensor	PTS2 12-bit pedal travel strength signal on SENT2 channel is too high, out of range.	Strength signal > 4088	After system start up	50 msec	Type A MIL Illumination.
PTS_SENS2_SIG2_OOR_LOW_ERROR	C05CE	This monitor checks if: • defective sensor	PTS2 12-bit pedal travel strength signal on SENT2 channel is too low, out of range.	Strength signal = 0	After system start up	50 msec	Type A MIL Illumination.
Group 19 - Motor Position							
MPS2_CORRELATION_ERROR	C058E	This monitor checks if: • MPS2 Failure • Note: MPS1 failure results in BOOSTED_BRAKE_SYSTEM_FAILURE for lack of motor rotation / pressure build	MPS1 is SPI based with a 50 usee update rate. MPS2 is SENT based with a 1 msec update rate. During motor rotation there is an expected difference in MPS1 and MPS2 based on the different time sampling rates (time lag on MPS2). MPS 1 and 2 moving different direction; or MPS 1 and 2 stopped at different relative postion than history	|MPS1 - MPS2| > 2 Degrees + 3 Degrees (motor speed offset) MPS 1 and 2 moving different direction; or MPS 1 and 2 stopped at different relative postion than history	Signal is valid	100 ms Goal: 18000	Type A MIL Illumination.
MPS2_SENT_RECEIVE_ERROR	C2A1A	This monitor checks if: MPS2 Signal Failure	Monitor MPS2 sent data received from the SentSensor.	This failsafe detects when MPS2 sent data received from the SentSensor is out of the valid range.	MPS signal data is received.	5 msec	Type A MIL Illumination.
MPS_BIST_FAULT	C058A	This monitor checks if: MPS Built-in-Self-Test failure	Testing of this module should include running BIST at various MPS angles. Tbe ECU performs an independent calculation parallel to internal MPU sensor BIST software. The fault will occur when the parallel calculations don't match.	The value calculated within the MPS does not equal the ECU calculated value.	BIST Inputs are not faulty.	30 msec	Type A MIL Illumination.
MPS1_NOT_ALIVE_FAILURE	C058A	This monitor checks if: MPS1 Signal Failure	Any Condition	MPS == MPS_prev	MPS1 does not change for 5 consecutive readings.	100ms	Type A MIL Illumination.
Group 22 - Power Supply Failures							
KL30_1_OPEN_OR_SHRTED_TO_GND	U3006	This monitor checks if: • Fuse blown (Open) • Short_to_Ground	Afeedback ratio is calculated based on the KL30_1_Fdbk_A and KL30_2_Fdbk_B. • If the feedback ratio is lower than the valid lower threshold ratio, then KL30_1_Open_or_Shrted_to_Gnd fault is set	• Ratio = (KL30_1-KL30_2)/(KL30_1+KL30_2) • If PSSW1 AND PSSW2 are turned OFF OR at least one safety switch is turned ON • Fault is set if ratio is less than -30% • If PSSW1 AND/OR PSSW2 are turned ON and all safety switches are turned OFF, • Fault is set if ratio is less than -10%	• Power ON, Continuous Failsafing	75ms	Type B. MIL Illumination.
KL30_2_OPEN_OR_SHRTED_TO_GND	U3007	This monitor checks if: • Fuse blown (Open) • Short_to_Ground	Afeedback ratio is calculated based on the KL30_1_Fdbk_A and KL30_2_Fdbk_B. • If this feedback ratio exceeds the valid upper threshold ratio, then KL30_2_Open_or_Shrted_to_Gnd fault is set. Note: Although the SW to tries to detect Fuse Blown/Shorted to ground with both switches on, fuse blown fault will not be detected due to the nature of the circuit and shorted to ground also may not be detected due to the damage that may be caused by this condition. Do not test this condition.	• Ratio = (KL30_1-KL30_2)/(KL30_1+KL30_2) • If PSSW1 AND PSSW2 are turned OFF OR at least one safety switch is turned ON, • Fault is set if ratio is greater than 30% • If PSSW1 AND/OR PSSW2 are turned ON and all safety switches are turned OFF, • Fault is set if ratio is greater than 10%	• Power ON, Continuous Failsafing	75ms	Type B. MIL Illumination.
PB_UNDERVOLTAGE	P0562	This monitor checks if: • Vehicle Battery Voltage Supply is providing low voltage levels. • Defective cables. • Defective printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously lower than 8.5V for more than 150 msec then the fault is set. When the system voltage is continuously greater than 9.0V for more than 100 msec then the fault is cleared.	Filtered system voltage < 8.5V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	150 ms	Type B. MIL Illumination.
KL30_1_UNDERVOLTAGE	P0562	This monitor checks if: • Vehicle Battery Voltage Supply is providing low voltage levels. • Defective cables. • Defective printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously lower than 8.5V for more than 150 msec then the fault is set. When the system voltage is continuously greater than 9.0V for more than 100 msec then the fault is cleared.	Filtered system voltage < 8.5V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	150 ms	Type B. MIL Illumination.
KL30_2_UNDERVOLTAGE	P0562	This monitor checks if: • Vehicle Battery Voltage Supply is providing low voltage levels. • Defective cables. • Defective printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously lower than 8.5V for more than 150 msec then the fault is set. When the system voltage is continuously greater than 9.0V for more than 100 msec then the fault is cleared.	Filtered system voltage < 8.5V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	150 ms	Type B. MIL Illumination.
KL30_1_EX_UNDERVOLTAGE	P0562	This monitor checks if: • Vehicle Battery Voltage Supply is providing excessively low voltage level. • Defective cable. • Defected printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously lower than 7.0V for more than 150 msec then the fault is set. When the system voltage is continuously greater than 7.5V for more than 150 msec then the fault is allowed to be cleared if not ignition latched.	Filtered system voltage < 7.5V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	150 ms	Type B. MIL Illumination.
KL30_2_EX_UNDERVOLTAGE	P0562	This monitor checks if: • Vehicle Battery Voltage Supply is providing excessively low voltage level. • Defective cable. • Defected printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously lower than 7.0V for more than 150 msec then the fault is set. When the system voltage is continuously greater than 7.5V for more than 150 msec then the fault is allowed to be cleared if not ignition latched.	Filtered system voltage < 7.5V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	150 ms	Type B. MIL Illumination.
KL30_EX_UNDERVOLTAGE	P0562	This monitor checks if: • Vehicle Battery Voltage Supply is providing excessively low voltage level. • Defective cable. • Defected printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously lower than 7.0V for more than 150 msec then the fault is set. When the system voltage is continuously greater than 7.5V for more than 150 msec then the fault is allowed to be cleared if not ignition latched.	Filtered system voltage < 7.5V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	150 ms	Type B. MIL Illumination.
PB_OVERVOLTAGE	P0563	This monitor checks if: • Voltage Supply is providing high voltage levels. • Defective printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously greater than 16.8V for more than 100 msec then the fault is set. When the system voltage is continuously less than 16.3V for more than 100 msec then the fault is cleared.	Filtered system voltage > 16.8 V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	100 ms	Type B. MIL Illumination.
KL30_1_OVERVOLTAGE	P0563	This monitor checks if: • Voltage Supply is providing high voltage levels. • Defective printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously greater than 16.8V for more than 100 msec then the fault is set. When the system voltage is continuously less than 16.3V for more than 100 msec then the fault is cleared.	Filtered system voltage > 16.8 V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	100 ms	Type B. MIL Illumination.
KL30_2_OVERVOLTAGE	P0563	This monitor checks if: • Voltage Supply is providing high voltage levels. • Defective printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously greater than 16.8V for more than 100 msec then the fault is set. When the system voltage is continuously less than 16.3V for more than 100 msec then the fault is cleared.	Filtered system voltage > 16.8 V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	100 ms	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
KL30_1_EX_OVERVOLTAGE	P0563	This monitor checks if: • Voltage Supply is providing excessively high voltage levels. • Defective printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously greater than 18.8V for more than 15 msec then the fault is set. When the system voltage is continuously less than 18.3V for more than 100 msec then the fault is cleared.	Filtered system voltage > 18.8V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	15 ms	Type B. MIL Illumination.
KL30_2_EX_OVERVOLTAGE	P0563	This monitor checks if: • Voltage Supply is providing excessively high voltage levels. • Defective printed circuit board.	System voltage is monitored continuously but the fault is not enabled during Engine crank. When the system voltage is continuously greater than 18.8V for more than 15 msec then the fault is set. When the system voltage is continuously less than 18.3V for more than 100 msec then the fault is cleared.	Filtered system voltage > 18.8V	• Engine is not being cranked • System is not re-initializing or shutting down • System is not shutting down	15 ms	Type B. MIL Illumination.
SYSTEM_SELF_TEST_HOLD	P0562	This monitor checks if: • Voltage Supply is providing excessively low or high voltage levels. • Defective printed circuit board.	System Self Test will not start if either of the following conditions are present: Polaris is not initialized Unfiltered System Voltage is outside the Excessive range (< 7.0V or >18.8V) If the System Self Test is delayed continuously for more than 100 msec then the fault is set.	Polaris.Resync_Seq_Error = TRUE or Unfiltered system voltage < 7.0V or Unfiltered system voltage > 18.8V	• Polaris is not initialized yet • System Voltage is outside the Excessive range (<7.0 V or >18.8V) Have not finished self-test	5 ms	Type B. MIL Illumination.
PRIMARY_WAKEUP_LINE_STUCK_LOW	P2534	This monitor checks if: HW ignition line failure	The MCU compares the state of the Primary Wakeup Line with the a CAN signal from the ECM indicating whether the line is being driven high or low. If the Primary Wakeup Line is read as Low but CAN message signal indicates it should be high for a continuous 3 sec then the fault is set. This fault is not enabled if the Missing PPEI Engine General Status 1 CAN message fault is set.	(State of Primary Wakeup line == Not Wake) && (CAN Signal == (CRANK || RUN))	• Primary Wakeup COMMS Signal is Valid (Singal is Valid when MISSING_PPEI_ENGINE_GENERAL_STATUS_1 fault is not latched)	2s	Type B. MIL Illumination.
PRIMARY_WAKEUP_LINE_STUCK-HIG H	P2535	This monitor checks if: HW ignition line failure	The MCU compares the state of the Primary Wakeup Line with the a CAN signal from the ECM indicating whether the line is being driven high or low. If the Primary Wakeup Line is read as High but CAN message signal indicates it should be low for a continuous 3 sec then the fault is set. This fault is not enabled if the Missing PPEI Engine General Status 1 CAN message fault is set.	(State of Primary Wakeup line == Wake) && (CAN Signal != (CRANK || RUN))	• Primary Wakeup COMMS Signal is Valid (Singal is Valid when MISSING_PPEI_ENGINE_GENERAL_STATUS_1 fault is not latched) • AND • Primary Wakeup Line is ON	2s	Type B. MIL Illumination.
PWR_SUP_V5_VIO_ERRATIC	P0606	This monitor checks if: • Defective internal 5 V supply circuit • Defective printed circuit board • Defective microprocessor feedback input port • Defective Polaris ASIC feedback input port	If the filtered 5V supply toggles outside the allowed range but does not stay there long enough to mature the INTERNAL_5V_SUPPLY_VOLT_FAILURE then this fault is matured by an up/down counter on the condition	If the filtered System Voltage toggles as per the below range Filtered system voltage ? 4.75V Filtered system voltage ? 5.25 V	• Internal 5V supply is enabled • AND • None of the following are taking place: • System is initializing • System is re-initializing • Engine is being cranked • When requested by Diagnostic commands System is shutting down	800 counts/80ms minimum	Type A MIL Illumination.
SYSTEM_SELF_TEST_TIMEOUT	P0562	This monitor checks if: Faulted ECU	If the ECU self test does not complete in the alloted amount of time, then set this fault. This fault allows to properly inform the driver that the EBCM functionality is not available. Note- Timeout fault is latched if system self-test doesn't finish within 2 seconds. This time doesn't include the on-hold time if the battery voltage is out of range.	None	Runs duting startup	5 msec	Type B. MIL Illumination.
PWR_SUP_V5_1_RANGE_LO W	C05D1	This monitor checks if: • Defective motor position sensor • Defective pedal travel sensor • Defective printed circuit board	The MCU provides two 5V sensor supplies for the Pedal Travel and Motor Position Sensors (each supply powers one circuit of the PTS and one circuit of the MPS). The MCU monitors the feedbacks on these two voltage supplies. If either supply is continuously < 4.85V for 100ms then the respective supply fault is set.	if PWR<4.85 for 100ms	• MPS1 sensor is enabled • PTS1 sensor is enabled AND • None of the following are taking place: • System is initializing • System is re-initializing • Engine is being cranked • When requested by Diagnostic commands System is shutting down	100ms	Type A MIL Illumination.
PWR_SUP_V5_1_RANGE_HIGH	C05D1	This monitor checks if: • Defective motor position sensor • Defective pedal travel sensor • Defective printed circuit board	The MCU provides two 5V sensor supplies for the Pedal Travel and Motor Position Sensors (each supply powers one circuit of the PTS and one circuit of the MPS). The MCU monitors the feedbacks on these two voltage supplies. If either supply is continuously > 5.15V for 100ms then the respective supply fault is set.	if PWR>5.15Vfor 100ms	• MPS1 is enabled • PTS1 is enabled AND • None of the following are taking place: • System is initializing • System is re-initializing • Engine is being cranked • When requested by Diagnostic commands System is shutting down	100ms	Type A MIL Illumination.
PWR_SUP_V5_1-ERRATIC	C05D1	This monitor checks if: • Defective motor position sensor • Defective pedal travel sensor • Defective printed circuit board	The MCU provides two 5V sensor supplies for the Pedal Travel and Motor Position Sensors (each supply powers one circuit of the PTS and one circuit of the MPS). The MCU monitors the feedbacks on these two voltage supplies. If a supply feedback is outside the acceptable range (< 4.85V or > 5.15V) then the respective erratic fault is matured at a weight of 50 toward a goal of 800 (fastest maturation = 80 msec). If the feedback voltage returns within the 4.85 - 5.15V range then the erratic fault is dematured at a weight of 1. Once the fault goal is reached then the fault is set and is ignition latched.	if PWR<4.85 or >5.15V	• MPS1 is enabled • PTS1 is enabled AND • None of the following are taking place: • System is initializing • System is re-initializing • Engine is being cranked • When requested by Diagnostic commands System is shutting down	80ms minimum	Type A MIL Illumination.
PWR_SUP_V5_2_RANGE_LO W	C05BB	This monitor checks if: • Defective motor position sensor • Defective pedal travel sensor • Defective printed circuit board	The MCU provides two 5V sensor supplies for the Pedal Travel and Motor Position Sensors (each supply powers one circuit of the PTS and one circuit of the MPS). The MCU monitors the feedbacks on these two voltage supplies. If either supply is continuously < 4.85V for 100ms then the respective supply fault is set.	if PWR<4.85 for 100ms	• MPS2 is enabled • PTS2 is enabled AND • None of the following are taking place: • System is initializing • System is re-initializing • Engine is being cranked • When requested by Diagnostic commands System is shutting down	100ms	Type A MIL Illumination.
PWR_SUP_V5_2_RANGE_HIGH	C05BB	This monitor checks if: • Defective motor position sensor • Defective pedal travel sensor • Defective printed circuit board	The MCU provides two 5V sensor supplies for the Pedal Travel and Motor Position Sensors (each supply powers one circuit of the PTS and one circuit of the MPS). The MCU monitors the feedbacks on these two voltage supplies. If either supply is continuously > 5.15V for 100ms then the respective supply fault is set.	if PWR>5.15Vfor 100ms	• MPS2 is enabled • PTS2 is enabled AND • None of the following are taking place: • System is initializing • System is re-initializing • Engine is being cranked • When requested by Diagnostic commands System is shutting down	100ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
PWR_SUP_V5_2_ERRATIC	C05BB	This monitor checks if: • Defective motor position sensor • Defective pedal travel sensor • Defective printed circuit board	The MCU provides two 5V sensor supplies for the Pedal Travel and Motor Position Sensors (each supply powers one circuit of the PTS and one circuit of the MPS). The MCU monitors the feedbacks on these two voltage supplies. If a supply feedback is outside the acceptable range (< 4.85V or > 5.15V) then the respective erratic fault is matured at a weight of 50 toward a goal of 800 (fastest maturation = 80 msec). If the feedback voltage returns within the 4.85 - 5.15V range then the erratic fault is dematured at a weight of 1. Once the fault goal is reached then the fault is set and is ignition latched.	if PWR<4.85 or >5.15V	• MPS2 is enabled • PTS2 is enabled AND • None of the following are taking place: • System is initializing • System is re-initializing • Engine is being cranked • When requested by Diagnostic commands System is shutting down	80ms minimum	Type A MIL Illumination.
PWR_SW_COIL_SUP_OPEN	C053B	This monitor checks if: • Disconnected Switch • PCB Problem	The KL30 supply inputs are switched on/off by the two Power Switches. The downstream KL30JNT supplies the ABS Coils, the BB Coils and the Motor Driver. These three circuits are individually switched on/off by separate Safety Relays. When the Safety Relay is on the downstream voltage feedback is expected to be high. The MCU monitors the voltage feedback downstream from the ABS Coil Safety Relay. If the feedback voltage is less than 80% of KL30JNT for a continuous 50 msec then the fault is set.	If Feedback Voltage < 80%of KL30_x	• Power ON, Continuous Failsafing	50ms	Type A MIL Illumination.
PWR_SW_COIL_SUP_SHORT	C053B	This monitor checks if: • Disconnected Switch • PCB Problem	The KL30 supply inputs are switched on/off by the two Power Switches. The downstream KL30JNT supplies the ABS Coils, the BB Coils and the Motor Driver. These three circuits are individually switched on/off by separate Safety Relays. When the Safety Relay is off the downstream voltage feedback is expected to be low. The MCU monitors the voltage feedback downstream from the ABS Coil Safety Relay. If the feedback voltage is not less than 80% of KL30JNT for a continuous 50 msec then the fault is set.	If Feedback Voltage > 80%of KL30_x	• Power ON, Continuous Failsafing	50ms	Type A MIL Illumination.
PWR_SW_BB_COIL_SUP_OPEN	C053B	This monitor checks if: • Disconnected Switch • PCB Problem	The KL30 supply inputs are switched on/off by the two Power Switches. The downstream KL30JNT supplies the ABS Coils, the BB Coils and the Motor Driver. These three circuits are individually switched on/off by separate Safety Relays. When the Safety Relay is on the downstream voltage feedback is expected to be high. The MCU monitors the voltage feedback downstream from the BB Coil Safety Relay. If the feedback voltage is less than 80% of KL30JNT for a continuous 50 msec then the fault is set.	If Feedback Voltage < 80%of KL30_x	• Power ON, Continuous Failsafing	50ms	Type A MIL Illumination.
PWR_SW_BB_COIL_SUP_SHORT	C053B	This monitor checks if: • Disconnected Switch • PCB Problem	The KL30 supply inputs are switched on/off by the two Power Switches. The downstream KL30JNT supplies the ABS Coils, the BB Coils and the Motor Driver. These three circuits are individually switched on/off by separate Safety Relays. When the Safety Relay is off the downstream voltage feedback is expected to be low. The MCU monitors the voltage feedback downstream from the BB Coil Safety Relay. If the feedback voltage is not less than 80% of KL30JNT for a continuous 50 msec then the fault is set.	If Feedback Voltage > 80%of KL30_x	• Power ON, Continuous Failsafing	50ms	Type A MIL Illumination.
PWR_SW_MOTOR_SUP_OPEN	C0595	This monitor checks if: • Disconnected Switch • PCB Problem	This fault is not enabled is a Watchdog fault is already set. The KL30_1 voltage supply input is switched on/off by the Valve Power Switch. When the Power Switch is turned on then the Power Switch Feedback is expected to be high. If the feedback voltage is less than 50% of the KL30_1 supply voltage for a continuous 50 msec then the fault is set	If Feedback Voltage <= 50% of KL30_1	• Power ON, Continuous Failsafing	50ms	Type A MIL Illumination.
PWR_SW_MOTOR_SUP_SHORT	C0595	This monitor checks if: • Disconnected Switch • PCB Problem	The KL30_1 voltage supply inputs are switched on/off by the Valve Power Switch. When the Switch is turned off then the Power Switch Feedback is expected to be low. If the feedback voltage is not less than 97% of the KL30_1 supply voltage for a continuous 50 msec then the fault is set.	If Feedback Voltage > 97% of KL30_1	• Power ON, Continuous Failsafing	50ms	Type A MIL Illumination.
PWR_SW_VALVE_SUP_OPEN	U3006	This monitor checks if: • Disconnected Switch • PCB Problem	This fault is not enabled is a Watchdog fault is already set. The KL30_2 voltage supply input is switched on/off by the Valve Power Switch. When the Power Switch is turned on then the Power Switch Feedback is expected to be high. If the feedback voltage is less than 50% of the KL30_2 supply voltage for a continuous 50 msec then the fault is set	If Feedback Voltage <= 50% of KL30_2	• Power ON, Continuous Failsafing	50ms	Type B. MIL Illumination.
PWR_SW_VALVE_SUP_SHORT	U3006	This monitor checks if: • Disconnected Switch • PCB Problem	The KL30_2 voltage supply inputs are switched on/off by the Valve Power Switch. When the Switch is turned off then the Power Switch Feedback is expected to be low. If the feedback voltage is not less than 97% of the KL30_2 supply voltage for a continuous 50 msec then the fault is set.	If Feedback Voltage > 97% of KL30_2	• Power ON, Continuous Failsafing	50ms	Type B. MIL Illumination.
PWR_SW_MERGE_SUP_OPEN	C0595	This monitor checks if: • Disconnected Switch • PCB Problem	This fault is not enabled is a Watchdog fault is already set. The KL30_1 voltage supply input is switched on/off by the Valve Power Switch. When the Power Switch is turned on then the Power Switch Feedback is expected to be high. If the feedback voltage is less than 50% of the KL30_1 supply voltage for a continuous 50 msec then the fault is set	If Feedback Voltage <= 50% of KL30_2	• Power ON, Continuous Failsafing	50ms	Type A MIL Illumination.
PWR_SW_MERGE_SUP_SHORT	C0595	This monitor checks if: • Disconnected Switch • PCB Problem	The KL30_1 voltage supply inputs are switched on/off by the Valve Power Switch. When the Switch is turned off then the Power Switch Feedback is expected to be low. If the feedback voltage is not less than 97% of the KL30_1 supply voltage for a continuous 50 msec then the fault is set.	If Feedback Voltage > 97% of KL30_2	• Power ON, Continuous Failsafing	50ms	Type A MIL Illumination.
SYS_ASIC_VCP12_U12_VOLTAGE. LOW--INT	P0606	This monitor checks if: Defective vehicle battery or Charging system Otherwise: -Defective system ASIC -Defective printed circuit board. • Defective system ASIC	The Polaris ASIC provides an internal VCP12 voltage regulator which is required to operate the I_SSR amplifier and to maintain regulation of theVA5pO regulators and the U3 and U1 linear regulators. If the VCP12 voltage is less that 7.25 V for 44 ?sec then the Polaris sets the VPC12 Low Voltage Warning SPI bit to True. Software monitors this SPI bit. If it is continuously True for more than 100 msec then the fault is set.	VCP12 voltage is less that 7.25 V for 44 ?sec	• Polaris is initialized	100 msec	Type A MIL Illumination.
SYS_ASIC_VCP12_U12_VOLTAGE. LOW--EXT	P0562	This monitor checks if: Defective vehicle battery or Charging system Otherwise: -Defective system ASIC -Defective printed circuit board. • Defective system ASIC	The Polaris ASIC provides an internal VCP12 voltage regulator which is required to operate the I_SSR amplifier and to maintain regulation of theVA5pO regulators and the U3 and U1 linear regulators. If the VCP12 voltage is less that 7.25 V for 44 ?sec then the Polaris sets the VPC12 Low Voltage Warning SPI bit to True. Software monitors this SPI bit. If it is continuously True for more than 100 msec then the fault is set.	VCP12 voltage is less that 7.25 V for 44 ?sec	• Polaris is initialized	100 msec	Type B. MIL Illumination.
SYS--ASIC--CHARGE_PUMP_OVER_VOLT	P0606	This monitor checks if: • Defective system ASIC	The Polaris ASIC provides a two-stage charge pump to produce a voltage greater than the VCP12 voltage. If the charge pump voltage exceeds VCP12 voltage by more than 13V for 53 msec then the Polaris sets the Charge Pump Overvoltage Limit SPI bit to True. Software monitors this SPI bit. If it is continuously True for more than 100 msec then the fault is set.	charge pump voltage exceeds VCP12 voltage by more than 13V for 53 msec	• Polaris is initialized	100 msec (145.2 ms)	Type A MIL Illumination.
SYS_ASIC_VDG_RANGE_FAULT	P0606	This monitor checks if: • Defective system ASIC	Verify that the KL30_1 Power Switch command is not stuck On. The ASIC VDG pin controls the KL30_1 Power Switch. While the Power Switch is commanded off, the SW reads the ASIC's VDG voltage feedback. When the VDG voltage is continuously >= 1.0V for more than 100 msec then the fault is set.	SSR ON: VDBat+3V <= VDG <= VDBat+12V SSROFF: VDG <= 1.0V	• Polaris is initialized	100 msec	Type A MIL Illumination.
SYS_ASIC_VBAT_SW-OVERC URRENT	P0606	This monitor checks if: • Defective system ASIC	The Polaris ASIC provides an overcurrent protected VBAT_SW output used for powering sensors and external circuits. If the VBAT_SW current draw exceeds 150 mA for 800 ?sec then the Polaris sets the VBAT_SW Overcurrent SPI bit to True. Software monitors this SPI bit. If it is continuously True for more than 25 msec then the fault is set.	VBAT--SW Enable and VBAT_SW Over-Current SPI bits are both TRUE	• Polaris is initialized	25 msec	Type A MIL Illumination.
SYS--ASIC_VBAT_SW_CORR	P0606	This monitor checks if: • Defective system ASIC	The MCU shall read the ASIC's VBAT_SW Voltage Result SPI field and perform a plausibility check against the measured VBAT voltage pin on the MCU. When the difference between the two voltage values is continuously > 1.75V for more than 25 msec then the fault is set.	Voltage difference > 1.75 Volts	• Polaris is initialized	15 msec	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
PWR_SUP_V5_VIO_RANGE_FAILURE	P0606	This monitor checks if: • Defective system ASIC	The U5 power supply regulates battery voltage down to 5V to supply such circuits as network communication transceivers, internal sensors and ADC references. If U5 is outside the acceptable range (<4.75V or >5.1V) continuously for 105 ?sec then the ASIC shall continue to attempt to regulate U5 and set the U5 Out of Range Warning SPI bit to True. Software monitors this SPI bit. If it becomes True then the fault is set immediately.	The MCU shall monitor the ASIC's U5 Out of Range Warning SPI bit. (<4.75Vor >5.1V)	• Polaris is initialized	5 msec	Type A MIL Illumination.
SYS_ASIC_CHARGE_PUMP_UNDER_VOLT	P0606	This monitor checks if: • Defective system ASIC	The Polaris ASIC provides a two-stage charge pump to produce a voltage greater than the VCP12 voltage. If the charge pump voltage exceeds VCP12 voltage by less than 9.5V for 5.5 msec then the Polaris sets the Charge Pump Undervoltage Limit SPI bit to True. Software monitors this SPI bit. If it is continuously True for more than 100 msec then the fault is set.	If the charge pump voltage exceeds VCP12 voltage by less than 9.5V for 5.5 msec	• Polaris is initialized	100 msec (105.5 ms)	Type A MIL Illumination.
U5_ASIC_ADC_REF.FAULT	P0606	This monitor checks if: • Defective system ASIC or circuit board	The 5V regulated supply is read at the ASIC. If it is not within the range, then the fault is set.	Asic U5 is not within the 4.75V and 5.25V	Polaris is initialized	80 msec	Type A MIL Illumination.
Group 20 - BOOST SYSTEM							
BOOSTED_BRAKE_SYSTEM_FAILED	C0021	This monitor checks if: Internal eBoost failure	Error Threshold (Y value) is a linear lookup table value which is a function of the Boost Pressure Target (X value). X0 : 0 BAR , Y0 : 0 BAR X1 : 6 BAR , Y1 : 3 BAR X2 : 20 BAR , Y2 : 4 BAR X3 : 200 BAR , Y0 : 40 BAR When ABS is active the Y values are increased by 30% When the boost error exceeds this threshold the "error" signal is integrated each loop and when it exceeds 2000 Bar-msec the fault will set.	Derivative of the Boost pressure target > (-150 Bar/s) AND Derivative of Boost pressure < 200 Bar/s	The Measured Boost Pressure is compared against an "error" threshold and sets a fault when the difference is large enough to cause possible under braking of the vehicle. The difference or "error" threshold itself is a function of the Boost Pressure Target such that larger errors are accepted as the requested pressure increases (i.e. a request of 30 bar that results in a 10 bar pressure is considered more consequential than a 20 bar error at a pressure request of 180 bar). This error threshold gets desensitized when slip control is active to account for the more dynamic boost pressure response when individual wheel control is active. Right now this is a percentage of the base error threshold, but will need to be enhanced. When the measured pressure is less than the error target the fault maturity counter accumulates at a rate proportional to the error. When the counter reaches a maturation threshold the fault will get set and the system will enter Push Through mode.	5 ms	Type B. MIL Illumination.
BOOSTED_BRAKE_SYSTEM_FAILED_CRANK	P0562	This monitor checks if: Internal eBoost failure	Error Threshold (Y value) is a linear lookup table value which is a function of the Boost Pressure Target (X value). X0 : 0 BAR , Y0 : 0 BAR X1 : 6 BAR , Y1 : 3 BAR X2 : 20 BAR , Y2 : 4 BAR X3 : 200 BAR , Y0 : 40 BAR When ABS is active the Y values are increased by 30% When the boost error exceeds this threshold the "error" signal is integrated each loop and when it exceeds 2000 Bar-msec the fault will set.	Derivative of the Boost pressure target > (-150 Bar/s) AND Derivative of Boost pressure < 200 Bar/s and CRANKING is present	The Measured Boost Pressure is compared against an "error" threshold and sets a fault when the difference is large enough to cause possible under braking of the vehicle. The difference or "error" threshold itself is a function of the Boost Pressure Target such that larger errors are accepted as the requested pressure increases (i.e. a request of 30 bar that results in a 10 bar pressure is considered more consequential than a 20 bar error at a pressure request of 180 bar). This error threshold gets desensitized when slip control is active to account for the more dynamic boost pressure response when individual wheel control is active. Right now this is a percentage of the base error threshold, but will need to be enhanced. When the measured pressure is less than the error target the fault maturity counter accumulates at a rate proportional to the error. When the counter reaches a maturation threshold the fault will get set and the system will enter Push Through mode.	5 ms	Type B. MIL Illumination.
BRAKE_BY_WIRE_HIGH_LEVEL_MONITOR_FAILURE_CRANK	P0562	This monitor checks if: Base brake values are energized in a boosted brake mode, while there are any parts of the boost logic which indicate that boosted brakes should not be enabled.	The goal of this fault monitor is to look for conditions where the base brake values are energized in a boosted brake mode, while there are any parts of the boost logic which indicate that boosted brakes should not be enabled. The validity of the driver inputs, base brake mode, Actuator control mode, Boost/Brake Arbitrator states, and the Electric drive states must all agree that boosted brakes are allowed for the base brake valves to be in a boosted condition during CRANKING. Otherwise the fault will be matured.	• (Pedal Travel signal is not valid AND SCP is invalid) OR • Boost Arb targeted pressure is not available OR • BOOST System in INHIBITED OR • Electric Drive state is not active or not running OR •Actuator Control is not allowed OR •CRANKING is present	• Pedal travel sensor signal • SCP value • Boost Arb state • Electric drive status	200 msec	Type B. MIL Illumination.
BOOSTED_BRAKE_PRESS_TRAP_CLR_FAILURE	C0021	This monitor checks if: Internal eBoost failure	Boost Pressure reading above a threhsold when no active braking	CASE 1: After three Attempts at Re-zeroing AND ((Boost Pressure still > 1.75 bar) AND (Motor found to be enaged via torque reading, enabling this pressure)) CASE 2: After three Attempts at Re-zeroing AND ((Boost Pressure still > 10 bar) AND (Motor not engaged -> a sign of pressure sensor offset or mechanically stuck plunger))	This function monitors the uninteded boost pressure and calls for a re-zero if it observes. If during no-braking activity/request we see a non-zero boost pressure in the system (pressure above a threshold and integral of it crossing another threshold) it could either be a possible case of 'trapped pressure' with help of motor effort due to DAP (piston) blocking the compensation port due to error in linear position (could be due to any unknown reason) OR an error in pressure sensor reading, basically an offset. The failsafe algorithm identifies if it is trapped due to wrong DAP position and tries 're-zeroing', a routine similar to 'zeroing' that happens at every ignition cycle, driving the plunder all the way back to hard-stop, opening the compensation-port and resetting the the linear position. It tries it three times, if the pressure reading is not gone and we see motor effort/engaged by monitoring torque, we set this fault. The second way we can set this fault is if after three re-zero tries, we see the pressure reading still there but the motor is not engaged and value of the offset is above a second threshold, we set this fault	Maximum 14 Seconds (depends on the magnitude of pressure offset observed, decreases with increase in offset value, as integral threhsold is reached early)	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
LOW_FLUID_PRESSURE--BUILD_FAILURE	C0021	This monitor checks if: Ar ingestion in DAP due to reservoir emptying due to leakage.	DAP stroke > 15 mm and Boost Pressure < 15 bar, when pressure is built with 4 ABS Iso valves are closed.	DAP stroke > 15 mm and Boost Pressure < 15 bar, when pressure is built with 4 ABS Iso valves are closed.	If the system is in low fluid level without a brake apply in the last 5 minutes, the 4 wheels will be isolated using the ABS Iso valves, and a pressure build in the DAP will be commanded to evaluate the compliance.	1 failed test execution	Type B. MIL Illumination.
BOOSTED_BRAKE_SYSTEM_DYNAMIC_LEAK	C05B0	This monitor checks if: Monitors for leaks in the braking system at the circuit level during braking events. This is different from the Static Leak check which looks for leaks at the channel level at shutdown.	The leak detection logic compares pressure gradient threshold against the measured pressure gradient. Once the error last longer than a time threshold, and the pressure error integral passes its threshold, leak is detected. The pressure gradient can be estimated from Dap flow rate and PV information; Similarly, pressure can be estimated from Dap volume and P V information. Here the worst case PV is taken	There are 12 calibrations associated with this failsafe so it is impossible to describe the interation of all of them in this document. Ultimately when the pressure error integral exceeds 20 bar AND the pressure gradient error integral exceeds 3000 Bar/s the fault is set.	Boost control active Boost pressure > 2 Bar Advancing DAP (no replenishment mode) No slip control active Faded brakes have not been detected	5 msec	Type A MIL Illumination.
BOOSTED_BRAKE_SYSTEM_LEAK_ISO_FAILED	C05B0	This monitor checks if: Set if the leakage circuit cannot be isolated successfully	Brake fluid leak on a channel or circuit without the ability to identify the location of the leak. OR Shutdown test identified leak on both circuits.	BOOSTED_BRAKE_SYSTEM_DYNAMIC_LEAK AND Circuit cannot be isolated OR Shutdown test identified leak on both circuits.	BOOSTED_BRAKE_SYSTEM_DYNAMIC_LEAK already present. OR Runs During Shutdown	230 msec	Type A MIL Illumination.
BOOST_POWER_MANAGEMENT_ENABLED_WARNING	P0562	This monitor checks if: Low input voltage to the module	This fault sets due low voltage in order to disable features before affect boosted brakes operation.	Motor Voltage < 9.3 V	Propulsion System Active = TRUE or (System Power Mode = Run and vehicle speed > then 3 kph)	5 occurrences of dipping below 9.3 V within 2 minutes without stable voltage above 11.3V	Type B. MIL Illumination.
PTU_ESTABLISH_HOME_POSITION	C0021	This monitor checks if: Set if motor could not find home position during startup	Motor could not find home position in 4sec. Motor gets stuck somewhere	Motor still moving to find home position for 4 sec	Cycle IGN or Clear Code	1 msec	Type B. MIL Illumination.
ACU_NOT_CONFIGURED	P0602	This monitor checks if: Set if EOL sensor Learn has not done or failed	Read DID 46, if DID 46 == 0F00, clear the fault, otherwise, set the fault	if DID 46 == 0F00, clear the fault, else, set the fault	Learn all EOL sensor, and comp port learn again and clear code	5 msec	Type A MIL Illumination.
ACU_DAP_COMPLIANCE_HIGH_ERROR	C2A20	This monitor checks if: Primary 3-Way valve leaks to Reservoir through MC Secondary 3-Way valve leaks to Reservoir through MC DAP pushes fluid to T3 chamber of reservoir through failed (leaky) check valve Leaky ISO (LF,LR,RF,RR) valve(s) Failed Seal(s) on the DAP piston Faulty Motor Position Sensor Faulty Boost Pressure Sensor	After the end of every ignition cycle, the shutdown test is run to check for integrity of the system's hydraulics. The 3-way valves are energized and DAP is commanded to a certain position. If the build time has not been reached with extended DAP movement, then this fault is set	Stroke > 16 mm to build 60 bar of Boost Pressure while DAP is isolated.	Runs During Shutdown	1 failed test execution	Type A MIL Illumination.
BRAKE_BY_WIRE_HIGH_LEVEL_MONITOR_FAILURE	C0021	This monitor checks if: Base brake values are energized in a boosted brake mode, while there are any parts of the boost logic which indicate that boosted brakes should not be enabled.	The goal of this fault monitor is to look for conditions where the base brake values are energized in a boosted brake mode, while there are any parts of the boost logic which indicate that boosted brakes should not be enabled. The validity of the driver inputs, base brake mode, Actuator control mode, Boost/Brake Arbitrator states, and the Electric drive states must all agree that boosted brakes are allowed for the base brake valves to be in a boosted condition. Otherwise the fault will be matured.	• (Pedal Travel signal is not valid AND SCP is invalid) OR • Boost Arb targeted pressure is not available OR • BOOST System in INHIBITED OR • Electric Drive state is not active or not running OR •Actuator Control is not allowed	• Pedal travel sensor signal • SCP value • Boost Arb state • Electric drive status	200 msec	Type B. MIL Illumination.
STATIC_CIRCUITO_LEAK_DETECTED	C05B0	This monitor checks if: System Leak	Leak fault, commands each circuit to build 30 bar pressure and checks for a leak by holding for 1sec. If the pressure drops to 24 bar, this fault is set.	Checks every wheel if there is a leak during shutdown.	Runs During Shutdown	1 failed test execution	Type A MIL Illumination.
STATIC_CIRCUIT1_LEAK_DETECTED	C05B0	This monitor checks if: System Leak	Leak fault, commands each circuit to build 30 bar pressure and checks for a leak by holding for 1sec. If the pressure drops to 24 bar, this fault is set.	Checks every wheel if there is a leak during shutdown.	Runs During Shutdown	1 failed test execution	Type A MIL Illumination.
BRAKE_BLEED_NOT_COMPLETED	C15C7	This monitor checks if: DID NOT write DID B2	DID B2==0	DID B2==0	Runs Continuous	5 msec	Type A MIL Illumination.
BOOST_STARTUP_FAILURE	C0021	This monitor checks if:	Ater mode mangner completes system self test the boost system looks to initialize the boost controller. If during this phase the conditions are not correct we will set a fault.	When boost control state is in initalze state a timer is incremented allowing a set time to initialize before a fault should be set.	Run after system selftest	4 seconds	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
BOOST_STARTUP_FAILURE_CRANK	P0562	This monitor checks if:	After mode mangner completes system self test the boost system looks to initialize the boost controller. If during this phase the conditions are not correct we will set a fault.	When boost control state is in initialze state a timer is incremented allowing a set time to initialize before a fault should be set.	Run during the power up initializtion of boost arbitration	4 seconds	Type B. MIL Illumination.
AC_PTU_MOTOR_STALL_DETECTED	C05C2	This monitor checks if: 1. Software Bug leading to a motor stall situation 2. Prolonged unfeasible speed/position request to the motor 3. Bad position sensor giving false position/speed info 4. Motor/Plunger mechanically stuck	When the motor is at standstill (foratleast 5 seconds) and the torque drawn by the motor is greater than a calculated stall torque limit (based on boost pressure + friction + factor of safety) then we classify as a possible case of motor stalled. The maturation rate is proportional to the extent of torque drawn by the motor. The minimum motor torque needed to mature this monitor is 1 Nm	If Motor is Stopped: If Motor Torque > (CalculatedThrehsold + Hyst): Count-Up Else if Motor Torque < (CalculatedThrehsold - Hyst): Count-Down Else: Do Nothing Else: Reset Monitor	Run only after pressure sensor is initialization and is valid	40000	Type A MIL Illumination.
Group 25 - Special Mode							
Group 27 - CAN Device							
EBCM_EPB_SWITCH_RSP_MSG_FAULT	U1122	This monitor checks if: Incoming message is not as expected	The incoming message on LIN is invalid then set this fault	Invalid message	• Fault will not be set during the following conditions: • within the first 2 seconds after System Power Mode has transitioned to RUN or OFF • Supply Voltage is less than 9V • System Power Mode is in crank mode. • EPB channel, node failure is not set. • PB_WAKE_UP_LINE_VOLTAGE_FAULT is not set.	Time = 15 msec Goal = 3	Type C, No MIL, "Emissions Neutral Diagnostic "
CAN_0_BUS_OFF_COMMS_FAULT	U0074	This monitor checks if: • HS bus Shorted • CAN transceiver faulty	CAN peripheral locks for the bit errors in transmitted messages and increments txerror counter if any error is detected	if txerror counter reaches 256 and doesn't transmit any message for the fault maturation time.	• When wake lines are enabled. • Node supervisor is in enabled state	220 msec	Type B. MIL Illumination.
CAN_1_BUS_OFF_COMMS_FAULT	U0073	This monitor checks if: • CE bus Shorted • CAN transceiver faulty	CAN peripheral locks for the bit errors in transmitted messages and increments Tx error counter if any error is detected, if Tx error counter reaches 256 the fault get set.	if txerror counter reaches 256 and doesn't transmit any message for the fault maturation time.	• When wake lines are enabled. • Node supervisor is in enabled state	220 msec	Type B. MIL Illumination.
KEY_TABLE_NOT_PROVISIONED	U1960	This monitor checks if: • Security peripheral general key is NOT provisioned.	1) The Authoritative Counter reaches its maximum value. 2) Any single Key Slot Provision State Flag for Key 2 through Key <n> is equal to a value of 0 while the MEC is equal to 0. 3) Upon receipt of ERC_KEY_EMPTY from the security peripheral (SECP). All messages authenticated using the missing key will be invalidated. Invalidated messages are discarded without any further processing.	1) The Authoritative Counter reaches its maximum value. 2) Any single Key Slot Provision State Flag for Key 2 through Key <n> is equal to a value of 0 while the MEC is equal to 0. 3) Upon receipt of ERC_KEY_EMPTY from the security peripheral (SECP).	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V £ VB £ 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	1 count	Type A MIL Illumination.
SECURITY_PERIPHERAL_PERFORMANCE	U1961	This monitor checks if: • Security Peripheral Performance - Performance or Incorrect Operation • Unable to generate a MAC • Unable to verify a MAC	1) If a request to the security peripheral to generate a Message Authentication Code (MAC) does not result in a response within a set amount of time*, the security peripheral is considered to have failed due to an internal error. 2) If a request to the security peripheral to verify a Message Authentication Code (MAC) does not result in a response within a set amount of time*, the security peripheral is considered to have failed due to an internal error. • The actual amount of time varies based upon security peripheral hardware used but will be less than a few seconds. • In the event the security peripheral cannot generate a MAC due to an internal error, the authenticated message shall be broadcast with a MAC equal to zero. • Failed verification means the message is discarded, no failsoft action is taken other than to set the DTC.	1) If a request to the security peripheral to generate a Message Authentication Code (MAC) does not result in a response within a set amount of time*, the security peripheral is considered to have failed due to an internal error. 2) If a request to the security peripheral to verify a Message Authentication Code (MAC) does not result in a response within a set amount of time*, the security peripheral is considered to have failed due to an internal error. * The actual amount of time varies based upon security peripheral hardware used but will be less than a few seconds.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V £ VB £ 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	1 count	Type A MIL Illumination.
Group 28 - CAN Communication							
MISSING_MSG_APA_STS	U1615	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
APA_STS_SECURrrY	U053B	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. • The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
APA_STS_ARC	U053B	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_BODY_GEN_INFO_3	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_MSG_BKUP_SYS_PWR_MD	U1609	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
BKUP_SYS_PWR_MD_ARC	U0447	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. •Any alive rolling count value that matches the previously received value will activate the fault counter. •Alive Rolling Count and Protection Value Errorswill be detected according to GMW8772.	New_ARC - Prev_ARC == 0	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 5 consecutive count sequence errors. Sliding Window Fail Threshold is 5 of 8	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_CHS_SYS_BRK_AXL_TRQ_INFO1_PRTCTD	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	• Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	250 msec	Type B. MIL Illumination.
CHS_SYS_BRK_AXL_TRQ_SECURITY	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 20 consecutive count sequence errors. Sliding Window Fail Threshold is 20 of 31	Type B. MIL Illumination.
CHS_SYS_BRK_AXL_TRQ_ARC	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 20 consecutive count sequence errors. Sliding Window Fail Threshold is 20 of 31	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_MSG_DAMPER_CTRL_INFO	U0139	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
DAMPER_CTRL_INFO_ARC	U043A	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. • The receiver shall check the ARC value with every new received frame. • Any alive rolling count value that matches the previously received value will activate the fault counter. •Alive Rolling Count and Protection Value Errorswill be detected according to GMW8772.	New_ARC - Prev_ARC = = 0	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
DAMPERCTRLJNFO_PROT_FAULT	U043A	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	The EBCM is monitoring all relevant signals of the messages that are received and unpacked. Alive Rolling Count and Protection Value Errors will be detected according to GMW8772.	ARC + Protection_Value != 0	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_EOCM_GNRL_INFO1_ACP3	U1615	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_EOCM_GNRL_INFO1_FCM	U0265	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_EXT_LGT_WSH_WPR_INFO	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_ISOLATED_GWCGM_MSG08_CSM	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition Enabling Criteria: CSM: CHASSINF_HITCH_VIEW = True -> MISSING_ISOLATED_GWCGM_MSG08_CSM	2500 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_MSG_1055	U0131	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_2018	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type B. MIL Illumination.
MISSING_MSG_2019	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_MSG_2022	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_2023	U1608	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_2024	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_2026	U1608	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_MSG_2038	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_MSG_2041	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type B. MIL Illumination.
MISSING_MSG_2042	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_MSG_2047	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type B. MIL Illumination.
MISSING_MSG_2050	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_MSG_2051	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_2073	U1615	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_2073_FCM	U0265	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_2077	U1615	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_MSG_2077_FCM	U0265	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_2081	U0265	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_2104	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition Fault is set only when MSG_2104 is enabled under below criteria Enabling Criteria: ##(PRODUCT_ARCH_VEH_ENG == PRODUCT_ARCH_VEH_ENG_ICE)	250 msec	Type B. MIL Illumination.
MSG_2104_ARC	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition Fault is set only when MSG_2104 is enabled under below criteria Enabling Criteria: ##(PRODUCT_ARCH_VEH_ENG == PRODUCT_ARCH_VEH_ENG_ICE)	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type B. MIL Illumination.
MISSING_MSG_2106	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
CHS_SYS_TOTAL_AXLE_TRQ_REQ_STS_FAILED	C2A07	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• When the incoming message is unpacked, the torque request status will be checked immediately.	Chassis System Total Axle Torque Request Status : Request Status = 3 OR 4 OR 5 OR 6 Following are the ENUMs for Signal CSTATRS_ReqSts $0=No_Request $1=Request_Honored $2=Lost_Arbitration $3=Serial_Data_Failure_Temporary $4=Serial_Data_Failure_Permanent $5=Control_System_Failure_Temporary $6=Control_System_Failure_Permanent	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_2107	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_MSG_2108	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_2161	U1608	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_2232	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_3016	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_3017	U1609	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_3018	U1609	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_3057	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_5163	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_MSG_5139	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_5400	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_MSG_9092	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type B. MIL Illumination.
MISSING_MSG_9094	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_NODE_STATUS_CAN2_MSG01	U1608	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_NODE_STATUS_CAN3_MSG01	U1609	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_NODE_STATUS_CAN2_MSG02	U1608	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_NODE_STATUS_CAN2_MSG03	U1608	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_NODE_STATUS_CAN3_MSG03	U1609	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_OCCPT_RSTRNT_INFO	U0151	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
PRPL_GEN_INFO_3_SECURITY	U0411	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 20 consecutive count sequence errors. Sliding Window Fail Threshold is 20 of 31	Type B. MIL Illumination.
PRPL_GEN_INFO_3_ARC	U0411	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 20 consecutive count sequence errors. Sliding Window Fail Threshold is 20 of 31	Type B. MIL Illumination.
MISSING_MSG_PST_CLSN_INFO	U0151	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
PST_CLSN_INFO_SECURITY	U0452	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 5 consecutive count sequence errors. Sliding Window Fail Threshold is 5 of 8	Type C, No MIL, "Emissions Neutral Diagnostic "
PST_CLSN_INFO_ARC	U0452	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 5 consecutive count sequence errors. Sliding Window Fail Threshold is 5 of 8	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_SRL_DAT_18_PRTCTD_MSG	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_SRL_DAT_19_PRTCTD_MSG	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
SRL_DAT_19_SECURITY	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 20 consecutive count sequence errors. Sliding Window Fail Threshold is 20 of 31	Type B. MIL Illumination.
SRL_DAT_19_ARC	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 20 consecutive count sequence errors. Sliding Window Fail Threshold is 20 of 31	Type B. MIL Illumination.
MISSING_SRL_DAT_2_PRTCTD_MSG	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_SRL_DAT_20_PRTCTD_MSG	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
SRL_DAT_20_SECURITY	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 10 consecutive count sequence errors. Sliding Window Fail Threshold is 10 of 16	Type B. MIL Illumination.
SRL_DAT_20_ARC	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 10 consecutive count sequence errors. Sliding Window Fail Threshold is 10 of 16	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_SRL_DAT_21_PRTCTD_MSG	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_SRL_DAT_22_PRTCTD_MSG	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type B. MIL Illumination.
MISSING_SRL_DAT_25_PRTCTD_MSG	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_SRL_DAT_26_PRTCTD_MSG	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
SRL_DAT_26_SECURITY	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 12 consecutive count sequence errors. Sliding Window Fail Threshold is 12 of 16	Type B. MIL Illumination.
SRL_DAT_26_ARC	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 12 consecutive count sequence errors. Sliding Window Fail Threshold is 12 of 16	Type B. MIL Illumination.
MISSING_SRL_DAT_29_PRTCTD_MSG	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_SRL_DAT_34_PRTCTD_MSG	U163D	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_SRL_DAT_35_EOCM_PRTCTD_MSG	U1615	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_35_EOCM_SECURITY	U053B	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_35_EOCM_ARC	U053B	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_SRL_DAT_35_FCM_PRTCTD_MSG	U0265	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_35_FCM_SECURITY	U0566	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_35_FCM_ARC	U0566	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_SRL_DAT_40_PRTCTD_MSG	U0265	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_40_SECURITY	U0566	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 4 consecutive count sequence errors. Sliding Window Fail Threshold is 4 of 8	Type C, No MIL, "Emissions Neutral Diagnostic "

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SRL_DAT_40_ARC	U0566	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 4 consecutive count sequence errors. Sliding Window Fail Threshold is 4 of 8	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_SRL_DAT_42_VCU_PRTCTD_MSG	U164E	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
MISSING_SRL_DAT_46_PRTCTD_MSG	U0151	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 100 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	100 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_46_SECURITY	U0452	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 5 consecutive count sequence errors. Sliding Window Fail Threshold is 5 of 8	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_46_ARC	U0452	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 5 consecutive count sequence errors. Sliding Window Fail Threshold is 5 of 8	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_58_SECURITY	U0435	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_58_ARC	U0435	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_SRL_DAT_6_PRTCTD_MSG	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_MSG_S1RG_W HL_INFO	U0131	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 100 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	100 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
STRG_WHL_INFO_ARC	U0420	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_SYS_PWR_MD	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type B. MIL Illumination.
SYS_PWR_MD_ARC	U0422	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. •Any alive rolling count value that matches the previously received value will activate the fault counter. •Alive Rolling Count and Protection Value Errorswill be detected according to GMW8772.	New_ARC - Prev_ARC = = 0	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type B. MIL Illumination.
MISSING_MSG_TRNS_EST_GR	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type B. MIL Illumination.
TRNS_EST_GR_SECURITY	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 12 consecutive count sequence errors. Sliding Window Fail Threshold is 12 of 16	Type B. MIL Illumination.
TRNS_EST_GR_ARC	U0401	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 12 consecutive count sequence errors. Sliding Window Fail Threshold is 12 of 16	Type B. MIL Illumination.
MISSING_VEH_ODO_DISP_VAL	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
MISSING_MSG_WHL_DIST	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_VEH_SPD_AVG_DRVN	U1611	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	(1) Message missing for 250 msec OR (2)Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V £ VB £ 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition • Vehicle is in logistic mode.	250 msec	Type B. MIL Illumination.
ECM_AVH_STATUS_FAULT	C15C6	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	When the incoming message is unpacked, the validity bit will be checked immediately.	AVHSwtchStats = 0	• Fault will not be set during the following conditions: • within the first 5 seconds after System Power Mode has transitioned to RUN • Supply Voltage is not in the range 9V<= V<=16V • Within the first 5 seconds of recovery from an under or over voltage condition CAN Bus Off Failure is latched	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_PSTN_OFST_FRM_TRM_3	U0139	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2.5 counts OR Message length is less than defined by DBC	• Fault will not be set during the following conditions: • within the first 2 seconds after System Power Mode has transitioned to RUN or OFF • Supply Voltage is less than 9V • CAN Bus Off Failure is detecting or latched • System Power Mode is in crank mode.	2.5 counts	Type C, No MIL, "Emissions Neutral Diagnostic "
PSTN_OFST_FRM_TRM_3_CHCKSUM	U043A	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• Checksum failure	Incorrect Checksum	• Fault will not be set during the following conditions: • within the first 2 seconds after System Power Mode has transitioned to RUN or OFF • Supply Voltage is less than 9V • CAN Bus Off Failure is detecting or latched • System Power Mode is in crank mode.	fastest maturation is 8 consecutive count sequence errors Sliding Window Fail Threshold is 8 out 16	Type C, No MIL, "Emissions Neutral Diagnostic "
PSTN-O FST_FRM_TRM_3_ARC	U043A	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	The EBCM is monitoring all relevant signals of the messages that are received and unpacked. The receiver shall check the ARC value with every new received frame. GM's SUM indicates a failed continuous operation.	GM's SUM indicates a failed continuous operation.	• Fault will not be set during the following conditions: • within the first 2 seconds after System Power Mode has transitioned to RUN or OFF • Supply Voltage is less than 9V • CAN Bus Off Failure is detecting or latched • System Power Mode is in crank mode.	fastest maturation is 8 consecutive count sequence errors Sliding Window Fail Threshold is 8 out 16	Type C, No MIL, "Emissions Neutral Diagnostic "
STRG_WHL_INFO_SECURITY	U0420	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. • The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
EOCM_GNRL_INFO1_ACP3_SECURITY	U053B	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. • The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
EOCM-G NRLJN FO1_ACP3_ARC	U053B	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring all relevant signals of the messages that are received and unpacked. • The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
EOCM_GNRL_INFO1_FCM_SECURI1Y	U0566	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
EOCM_GNRL_INFO1_FCM_ARC	U0566	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_MSG_9089	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 2500 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	2500 msec	Type B. MIL Illumination.
MISSING_SRL_DAT_141_PRTCTD_MSG	U1615	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 250 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	250 msec	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_141_ARC	U053B	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 3 consecutive count sequence errors. Sliding Window Fail Threshold is 3 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
SRL_DAT_141_SECURITY	U053B	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the Protection value with every new received frame. • GM's SUM indicates failed safety and failed security.	• GM's SUM indicates failed safety and failed security.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 3 consecutive count sequence errors. Sliding Window Fail Threshold is 3 of 16	Type C, No MIL, "Emissions Neutral Diagnostic "
MISSING_SRL_DAT_9_MSG	U0140	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The EBCM is monitoring the CAN bus for this message and checks if the message was received in the detection time.	Message missing for 625 msec OR Message length is less than defined by DBC	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	625 msec	Type B. MIL Illumination.
SRL_DAT_9_ARC	U0422	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	•The EBCM is monitoring all relevant signals of the messages that are received and unpacked. •The receiver shall check the ARC value with every new received frame. • GM's SUM indicates a failed continuous operation.	• GM's SUM indicates a failed continuous operation.	Fault is not set when: • While System Power Mode equals Start • Within the first 5 seconds after the Vehicle Power Mode has transitioned to Off, Run, or Propulsion • Supply voltage is not within the range: 9.0 V ? VB ? 16.0 V • Within the first 5 seconds of a recovery from an under or over voltage condition • Within the first 5 seconds of power up reset or a running reset • Bus off state is confirmed or ECU is recovering from a bus off condition	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
SRL_DAT_9_CHCKSUM	U0422	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• Checksum failure	Incorrect Checksum	• Fault will not be set during the following conditions: • within the first 2 seconds after System Power Mode has transitioned to RUN or OFF • Supply Voltage is less than 9V • CAN Bus Off Failure is detecting or latched • System Power Mode is in crank mode.	fastest maturation is 8 consecutive count sequence errors. Sliding Window Fail Threshold is 8 of 16	Type B. MIL Illumination.
Group 30 - Configuration							
ECU_ID_NOT_PROGRAMMED	P0602	This monitor checks if: • ECU ID not programmed at ECU/HCU assembly plant	• This fault will be latched, if there is novalid value for Security Data in NVRAM.	NVRAM_SECURE_CODE_BLK_ID == OxFF	• Power Switch is ON	1 count	Type A MIL Illumination.
VCFG_OPTIONS_NOT_PROG	P0602	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	• The CHASSINF VCFG component extends the former Function Enable logic. It now combines EOL programming with NVRAM and CALibrations, in order to activate/enable functions, features, and subsystems. This means that functionality is present in the code, that will be suppressed until activated by the new VCFG settings.	VCFG settings are not programmed/not available Vcfg_Options_Enable[VCFG_OPTIONS_ENABLE_BYTE_CAL] == (U8)VCFG_OPTIONS_CHECKS_SOME) OR (Vcfg_Options_Enable[VCFG_OPTIONS_ENABLE_BYTE_CAL] > (U8)VCFG_OPTIONS_CHECKS_NONE	• Power Switch is ON	1 count	Type A MIL Illumination.
VAF_CALIBRATIONJN VALID	P0602	This monitor checks if: • Problem at signal source • Problem at message source module • Problem with bus wiring • Problem at message receiving module	VAF file not configured properly	None	• Power Switch is ON	1 count	Type A MIL Illumination.
Group 32 - Miscellaneous							
Group 33 - Electronic Park Brake							
PB_ASIC_SYNC_ERROR	U3000	This monitor checks if: Faulty PB ASIC Faulty Main Micro	This is synchronization check to verify if the PB ASIC ADC measurements are aligned with the SPI read requests. The check itself is performed internally by PB ASIC and the result is written to SPI register. In case of synchronization error a corresponding flag within the SPI register shall be set.	This is synchronization check to verify if the PB ASIC ADC measurements are aligned with the SPI read requests. The check itself is performed internally by PB ASIC and the result is written to SPI register. In case of synchronization error a corresponding flag within the SPI register shall be set.	Always while system is awake	100 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_MOTOR_SUPPLY_OPEN_CIRCUIT_LEFT	C0616	This monitor checks if: - ECU clamp 30 supply is open.	In case the measured voltage on EPB Supply Voltage (VSBRIDGE) during KL30_V_DRV is enabled and EPB state is Apply or Release, is lower than the defined threshold the fault is detected.	In case the measured voltage on EPB Supply Voltage (VSBRIDGE) during KL30_V_DRV is enabled and EPB state is Apply or Release, is lower than the defined threshold the fault is detected.	- Left EPB actuation (apply or release) running.	500 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_MOTOR_SUPPLY_OPEN_CIRCUIT_RIGHT	C0616	This monitor checks if: - ECU clamp 30 supply is open.	In case the measured voltage on EPB Supply Voltage (VSBRIDGE) during KL30_V_DRV is enabled and EPB state is Apply or Release, is lower than the defined threshold the fault is detected.	In case the measured voltage on EPB Supply Voltage (VSBRIDGE) during KL30_V_DRV is enabled and EPB state is Apply or Release, is lower than the defined threshold the fault is detected.	- Right EPB actuation (apply or release) running.	500 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_SWDRV_GIO-FAULT	U3000	This monitor checks if: -Faulty PBASIC chip	If the Capella Asic delivers fault indication flags regarding short to battery, short to ground and overtemperature and at least one of the flags is activated for longer than the specified timeout the fault will be latched.	If the Capella Asic delivers fault indication flags regarding short to battery, short to ground and overtemperature and at least one of the flags is activated for longer than the specified timeout the fault will be latched.	Ignition on	500 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_HBRIDGE_5V_LOSS	C0616	This monitor checks if: - Internal hardware issue	While the test pulse pattern are generatedthe average of the measured voltage feedbacksduring SC-BAT and motor OC detection are stored.Out of these two samples the absolute difference is calculated. The calculated voltage then is compared against a specified threshold. If the calculated voltage is below these treshold the fault will be qualified as failed.	While the test pulse pattern are generatedthe average of the measured voltage feedbacksduring SC-BAT and motor OC detection are stored.Out of these two samples the absolute difference is calculated. The calculated voltage then is compared against a specified threshold. If the calculated voltage is below these treshold the fault will be qualified as failed.	When the system is awake and in IDLE and no external fault is currently in detection or latched	50 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_HBRIDGE_SUPPLY_DEVIATION	C0616	This monitor checks if: - Internal hardware issue	The EPB motor compares the supply voltage of the right and left H-Bridge side. If the supply voltage is within the range of 8-20Vand the deviation of the voltages is greater than 12% the fault is detected.	The EPB motor compares the supply voltage of the right and left H-Bridge side. If the supply voltage is within the range of 8-20V and the deviation of the voltages is greater than 12% the fault is detected.	- Ignition on - Supply voltage between 8 and 20 Volt	500 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_ASIC_ADC_COUNTER_ERROR	C0616	This monitor checks if: -Faulty PBASIC chip	The driver provides in addition to each ADC measurement a specific counter value. A fault is detected if the comparison of two consecutive ADC counter values does not result in deviation of 1 count.	The driver provides in addition to each ADC measurement a specific counter value. A fault is detected if the comparison of two consecutive ADC counter values does not result in deviation of 1 count.	Ignition On	2.5 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
pb_asic_verification_error	C0616	This monitor checks if: PB ASIC power supply out of range Faulty PBASIC Faulty Main Micro	This is the PB ASIC power supply voltage check. The check itself is performed internally by PB ASIC and the result is written to SPI register. In case of voltage monitor error a corresponding bit flag within the SPI register shall be set.	This is the PB ASIC power supply voltage check. The check itself is performed internally by PB ASIC and the result is written to SPI register. In case of voltage monitor error a corresponding bit flag within the SPI register shall be set.	Always while system is awake	100 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_ASIC_SWITCH_WAKEABILITY_ERROR	C0616	This monitor checks if: Faulty PBASIC	Capella ASIC wake-up sources configuration manipulated in a way that without any physical change on the PB Switch itself a wake-up condition caused by the switch could be detected. Capella ASIC set to sleep mode by controling the WAU pin to 0. After sleep mode is detected the WAU pin is set to 1 to wake up the ASIC. The bit 2 within the Capella 8Ah register is NOT set 1.	Capella ASIC wake-up sources configuration manipulated in a way that without any physical change on the PB Switch itself a wake-up condition caused by the switch could be detected. Capella ASIC set to sleep mode by controling the WAU pin to 0. After sleep mode is detected the WAU pin is set to 1 to wake up the ASIC. The bit 2 within the Capella 8Ah register is NOT set 1.	System preparing for shutdown.	2.5 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_ASIC_CURRENT_SENSE_ERROR	C0616	This monitor checks if: PB ASIC power supply out of range Faulty PBASIC	The software cyclic tests the current amplifier measurement path. If the measured signal is not in the range of 10.5 A to 17A the fault is detected.	The software cyclic tests the current amplifier measurement path. If the measured signal is not in the range of 10.5 A to 17A the fault is detected.	Always while system is awake	2.5 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_WDG_TIMEOUT_VIOLATION	C0616	This monitor checks if: Faulty PBASIC	The fault is set if any of the following conditions occure: Number of corrupted watchdog handshakes exceeds the limit Number of invalid watchdog handshakes exceeds the limit Watchdog overflow timeout Watchdog failure	The fault is set if any of the following conditions occure: Number of corrupted watchdog handshakes exceeds the limit Number of invalid watchdog handshakes exceeds the limit Watchdog overflow timeout Watchdog failure	System awake PBASIC initialized PB ASIC internal watchdog enabled	Immediatley	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_HIGH_SIDE_ENABLE_MISMATCH_FAULT	C0616	This monitor checks if: Faulty PBASIC	A verification test is triggered when there is a request to Enable/Disable the High side enable line. In next cycle, the current High side enable line status is compared with previously requested status. If the requested and current doesn't match for predefined filter time, then this fault is reported.	A verification test is triggered when there is a request to Enable/Disable the High side enable line. In next cycle, the current High side enable line status is compared with previously requested status. If the requested and current doesn't match for predefined filter time, then this fault is reported.	Always while system is awake	100 ms	Type C, No MIL, "Emissions Neutral Diagnostic "

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
PB_ASIC_CAPELLA_SPI_ERROR	U3000	This monitor checks if: PB ASIC detects: wrong number of received clock cycles for one frame, or CRC errror, or writing reading to non existintant address	This is the PB ASIC SPI transfer check. The check itself is performed internally by PB ASIC and the result is written to SPI register. In case of SPI error(SPICLK, CRC or ADR) a corresponding bit flag within the SPI register 0x03 is set.	This is the PB ASIC SPI transfer check. The check itself is performed internally by PB ASIC and the result is written to SPI register. In case of SPI error(SPICLK, CRC or ADR) a corresponding bit flag within the SPI register 0x03 is set.	Always while system is awake	40 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_MICRO_SWITCH_DISCONNECTED_LIN	U1122	This monitor checks if: • Switch disconnected • Defective LIN transceiver • LIN communication error	The EPB switch pattern has to be stable in the state "DISCONNECTED" (LIN bus communication is disturbed). The stability check takes between 80ms and 150ms. Afterwards the fault qualification is started. The total fault detection-time is increased by the delay of the stability check.	Switch disconnected pattern observed	• continuous	1200 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PBC_LOGICAL_SEQ_MONITOR	C0616	This monitor checks if: Defective ECU	• Fault is detected by Mando PBC	Program Sequence Fault detected	Vehicle Power Mode: OFF, ACCESSORY, RUN Vehicle Operating Conditions: Dynamic or Static state Exceptions: none	See Detection Rules (fault is detected by Mando PBC)	Type C, No MIL, "Emissions Neutral Diagnostic "
PBC_RUN_IN_NOT_DONE	C0616	This monitor checks if: Assembly check has not been performed yet	• Fault is detected by Mando PBC	Assembly Test Not Done	Vehicle Power Mode: OFF, ACCESSORY, RUN, Cranking Vehicle Operating Conditions: Dynamic and Static state Exceptions: none	See Detection Rules (fault is detected by Mando PBC)	Type C, No MIL, "Emissions Neutral Diagnostic "
PBC_POWERDOWN_EEPROM_F AILED	C0616	This monitor checks if: Unexpected Powerdown, Invalid EE • brakestate data, Actuation interrupted and not resumed in time or aborted	• Fault is detected by Mando PBC	Actuator status is UNKNOWN due to unexpected power down or EEPROM failure	Vehicle Power Mode: OFF, ACCESSORY, RUN Vehicle Operating Conditions: Dynamic, static state Exceptions: Disabled by calibration, Assembly check is not done	See Detection Rules (fault is detected by Mando PBC)	Type C, No MIL, "Emissions Neutral Diagnostic "
PBC_HOST_UNAVAILABLE	C0616	This monitor checks if: 1) HostAvailability different from AVAILABILITY_APPLY_RELEASE during actuation OR 2) MotorDriverState changed to None while actuation	If Actuator State is "Unknown" due to HwDriverControl: 1) HostAvailability different from AVAILABILITY_APPLY_RELEASE during actuation. 2) -MotorDriverState doesn't match MotorCommand for longer than 800ms during running actuation in EPBi FSS project variant -MotorDriverState doesn't match MotorCommand for longer than 80ms during running actuation in EPBi brake assembly (ZSB Bremse) project variant	Host is not available	While system is awake	See Detection Rules	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_APPLY_ENABLE_MISMATCH	C0616	This monitor checks if: -short circuit to GND/BATTERY -open circuit	The enable line self test failed or the enable line does not match the desired state out of the HSB.	The enable line self test failed or the enable line does not match the desired state out of the HSB.	Ignition on	10 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_APPLY_ENABLE_NO_CONTROL	C0616	This monitor checks if: - internal hardware issue	The hardware apply line lock mechanism is not working as designed	The hardware apply line lock mechanism is not working as designed	Ignition on	10 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_RELEASE_ENABLE_MISMATCH	C0616	This monitor checks if: -short circuit to GND/BATTERY -open circuit	The enable line self test failed or the enable line does not match the desired state out of the HSB.	The enable line self test failed or the enable line does not match the desired state out of the HSB.	Ignition on	10 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PB_RELEASE_ENABLE_NO_CONTROL	C0616	This monitor checks if: - internal hardware issue	The hardware release line lock mechanism is not working as designed	The hardware release line lock mechanism is not working as designed	Ignition on	10 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
EPB_COMMAND_RANGE_ERROR	C0616	This monitor checks if: • EPB decel request out of range	• This failsafe monitors the decel request received from the EPB and checks to see if it is out of range	Decel Request from EPB is greater than 9.83 m/s	• Continuous failsafing	250 ms	Type C, No MIL, "Emissions Neutral Diagnostic "
PBC_CRANKING_TIMEOUT	C0616	This monitor checks if: Power mode is Cranking	• When power mode is cranking, suspend actuation as long as it is cranking until timeout after 5 seconds	When Power Mode= Cranking, Then Suspend actuation as long as it is cranking and also provide the following options to Mando: 1. Timeout after 5 seconds and set the fault 2. Continue actuation	Power mode is Cranking	5 sec	Type C, No MIL, "Emissions Neutral Diagnostic "
PB--ASIC--STARTUP_ERROR	C0616	This monitor checks if: PB ASIC power supply out of range Faulty PB ASIC Faulty Main Micro	The fault is detected if: - PB ASIC internal Start-up test fails - PB ASIC internal Start-up test takes too long (>2.5ms) - initial PB ASIC configuration fails due to SPI error	The fault is detected if: - PB ASIC internal Start-up test fails - PB ASIC internal Start-up test takes too long (>2.5ms) initial PB ASIC configuration fails due to SPI error	Always while system is awake	Immediately	Type C, No MIL, "Emissions Neutral Diagnostic "
EPB_ASSIST_CURRENT_FEEDBACK_EXCEEDED	C0616	This monitor checks if: Excessive clamp force request. Ex.	Feedback current > 13.5 amps for 300 msec or Feedback current > 16.6 amps for 20 msec while the motor is being requested to apply clamp force	Feedback current > 13.5 amps for 300 msec or Feedback current > 16.6 amps for 20 msec	Runs continuously during EPB Assist	1 count	Type C, No MIL, "Emissions Neutral Diagnostic "
EPB_ASSIST_CURRENT_FEEDBACK_IMPLAUSIBLE	C0616	This monitor checks if: Request for clamp force with no feedback	If during EPB assist active control the current feedback doesn't eceeded min current for x number of requests for activation	Feedback Current < Min Current for > 150 msec. The results in 1 count	Runs continuously during EPB Assist	>= 4 counts	Type C, No MIL, "Emissions Neutral Diagnostic "
PBC_HOST_IGNORED_COMMAND	C0616	This monitor checks if: Defective ECU, or wrong conditions when EPB actuation was requested	PBC detects this fault if "Motor Driver State" does not change to current value of "Motor Command" for over 100ms, PBC sets FaultStatus[33] as 'Failed' and cancel the current actuation request (MotorCommand = STOP and then NONE) (Refer VDA/FR3.177)	"Motor Driver State" does not change to current value of "Motor Command" for over 100ms	Vehicle Power Mode: OFF, ACCESSORY, RUN Vehicle Operating Conditions: static state Exceptions: Disabled by calibration, Non-operational mode	100ms	Type C, No MIL, "Emissions Neutral Diagnostic "
Group 35 - Vacuum Pump Control							
Group 36 - Brake Pad Life Monitoring							
Group 38 - Systematic Errors							
TASK_OVERRUN_COREO	P0606	This monitor checks if: Software Error ECU Hardware Failure Input Signals To ECU causing high interrupt load	Atimer alarm used to activate a periodic task expires and the prior activation/execution of this task has not run to completion. If the number of multiple activations allowed (2) for the task has already been reached a fault is set.	multiple activation counter >= max number of activations Task_Overrun_Cnt>0	Always Enabled	9 counts Time: 10 ms Note: Although weight and goal implies setting after 2 occurrences, faults sets 10 ms	Type A MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
TASK_OVERRUN_CORE1	P0606	This monitor checks if: Software Error ECU Hardware Failure Input Signals To ECU causing high interrupt load	Atimer alarm used to activate a periodic task expires and the prior activation/execution of this task has not run to completion. If the number of multiple activations allowed (2) for the task has already been reached a fault is set.	multiple activation counter >= max number of activations Task_Overrun_Cnt>0	Always Enabled	9 counts Time: 10 ms Note: Although weight and goal implies setting after 2 occurrences, faults sets 10 ms later after the 1st occurence of 2	Type A MIL Illumination.
TASK_OVERRUN_CORE2	P0606	This monitor checks if: Software Error ECU Hardware Failure Input Signals To ECU causing high interrupt load	Atimer alarm used to activate a periodic task expires and the prior activation/execution of this task has not run to completion. If the number of multiple activations allowed (2) for the task has already been reached a fault is set.	multiple activation counter >= max number of activations Task_Overrun_Cnt>0	Always Enabled	9 counts Time: 10 ms Note: Although weight and goal implies setting after 2 occurrences, faults sets 10 ms later after the 1st occurence of 2	Type A MIL Illumination.
RUNNING_RESET_FAILURE	P0562	This monitor checks if: • Keep Alive Voltage Regulator not functional. • Processor looses complete power (system voltage). • Processor is incorrectly reset.	• Two blocks in NVRAM are used to failsafe the systems mode manager's ability to control the system shutdown process. During system initialization (each new ignition cycle), the contents of these two blocks are compared. If a mismatch is found, it indicates that mode manager was unable to control the system shutdown process on the previous ignition cycle. • Counter: Count 1-up • Monitor Rate: 10ms Note- This fault also sets when there is a startup after an improper shutdown with the vehicle not in park AND with the drivers foot on the brake pedal.	System failed to finish NVRAM update on the last module shut-down (ex. Disconnect battery from module before shutdown)	• Arb Boost State >= Enabled • A controlled shutdown is detected • System power mode != Diagnostic mode • PRNDL Position != PARK • Vehicle is moving as defined by WSS != IDLE or Invalid	5ms	Type B. MIL Illumination.
MPU_FAULT_TRW_SCS_COREO	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	Memory Protection Unit (MPU) detects an attempted memory access where there is no defined address range providing the needed permission.	None	Always Enabled	10 ms	Type A MIL Illumination.
MPU_FAULT_TRW_SCS_CORE1	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	Memory Protection Unit (MPU) detects an attempted memory access where there is no defined address range providing the needed permission.	None	Always Enabled	10 ms	Type A MIL Illumination.
MPU_FAULT_TRW_SCS_CORE2	P0606	This monitor checks if: Software Error Partial Microcontroller Failure	Memory Protection Unit (MPU) detects an attempted memory access where there is no defined address range providing the needed permission.	None	Always Enabled	10 ms	Type A MIL Illumination.
ITBC_LSM_FAULT	P0606	This monitor checks if: If the ITBC tasks execute out of order, or if a task is skipped or if the tasks do not complete, then this fault is set.	Set this fault , if the order of execution of ITBC tasks is not correct. If the tasks skip or if some tasks are left incomplete	None	• LIN communication	10 msec	Type A MIL Illumination.
ICC_FAILURE_COREO	P0606	This monitor checks if: ICC send or receive have been skipped.	ICC failsafe mechanism determines if any ICC receives or sends were skipped. At the beginning of every 10ms slot, every core in the scheduler runs the failsafe that checks if any of the ICC sends or receives were skipped in the previous 10ms slot. In case it was skipped the failsafe matures the ICC fault. The failsafe also tries to get back the ICC receives and sends to work normally from the next 10ms Slot.	At the beginning of every 10ms slot, every core in the scheduler runs the failsafe that checks if any of the ICC sends or receives were skipped in the previous 10ms slot.	Always Enabled	60 msec	Type A MIL Illumination.
ICC—FAILURE_CORE1	P0606	This monitor checks if: ICC send or receive have been skipped.	ICC failsafe mechanism determines if any ICC receives or sends were skipped. At the beginning of every 10ms slot, every core in the scheduler runs the failsafe that checks if any of the ICC sends or receives were skipped in the previous 10ms slot. In case it was skipped the failsafe matures the ICC fault. The failsafe also tries to get back the ICC receives and sends to work normally from the next 10ms Slot.	At the beginning of every 10ms slot, every core in the scheduler runs the failsafe that checks if any of the ICC sends or receives were skipped in the previous 10ms slot.	Always Enabled	60 msec	Type A MIL Illumination.
ICC_FAILURE_CORE2	P0606	This monitor checks if: ICC send or receive have been skipped.	ICC failsafe mechanism determines if any ICC receives or sends were skipped. At the beginning of every 10ms slot, every core in the scheduler runs the failsafe that checks if any of the ICC sends or receives were skipped in the previous 10ms slot. In case it was skipped the failsafe matures the ICC fault. The failsafe also tries to get back the ICC receives and sends to work normally from the next 10ms Slot.	At the beginning of every 10ms slot, every core in the scheduler runs the failsafe that checks if any of the ICC sends or receives were skipped in the previous 10ms slot.	Always Enabled	60 msec	Type A MIL Illumination.
Group 42 - Temperature Sensor							
TEMP_SENS_1_OUT—OF_RANGE_HIGH	P25C7	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	• The temp sensor diode feedback is monitored to check if the temperature is within the allowable range of -40 deg Celsius to 150 deg Celsius	Measured diode feedback voltage equals: Greater than 1.5 volts	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
TEMP_SENS_1_OUT—OF_RANGE_LOW	P25C6	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	• The temp sensor diode feedback is monitored to check if the temperature is within the allowable range of -40 deg Celsius to 150 deg Celsius	Measured diode feedback voltage equals: Less than 0.7 volts	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
TEMP_SENS_1_ERRATIC_FAULT	P25C8	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	Record the measured temperature as previous value. At next loop, calculate the absolute difference between the current and previous measured temperature and check if the diff is greater than 20 degree C.	The measured temperature absolute difference between current loop and previous loop is larger than 20 degree C	• Power switch is on and Input validation for Diode temp sensor is true	200 msec	Type B. MIL Illumination.
TEMP_SENS_1_CORRELATION_FAILURE	P25C5	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	Caculate the absolute difference between the measured temperature and micro die temperature	the absolute diff >= 50 degree C	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
TEMP_SENS_2_OUT—OF_RANGE_HIGH	C057A	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	• The temp sensor diode feedback is monitored to check if the temperature is within the allowable range of -40 deg Celsius to 150 deg Celsius	Measured diode feedback voltage equals: Greater than 1.5 volts	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
TEMP_SENS_2_OUT—OF_RANGE_LOW	C0579	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	• The temp sensor diode feedback is monitored to check if the temperature is within the allowable range of -40 deg Celsius to 150 deg Celsius	Measured diode feedback voltage equals: Less than 0.7 volts	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
TEMP_SENS_2_ERRATIC_FAULT	C057D	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	Record the measured temperature as previous value. At next loop, calculate the absolute difference between the current and previous measured temperature and check if the diff is greater than 20 degree C.	The measured temperature absolute difference between current loop and previous loop is larger than 20 degree C	• Power switch is on and Input validation for Diode temp sensor is true	200 msec	Type B. MIL Illumination.

Component/ System	Fault Code	Monitoring Strategy Description	Fault Detection Criteria	Threshold Value	Secondary Parameter and Enable Condition	Maturation Time	MIL Illumination
Group 1 - Wheel Speed Sensor							
TEMP_SENS_2_CORRELATION_FAILURE	C057C	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	Caculate the absolute difference between the measured temperature and micro die temperature	the absolute diff >= 50 degree C	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
TEMP_SEN S_3_OUT_OF_RAN GE_HIGH	C05B4	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	• The temp sensor diode feedback is monitored to check if the temperature is within the allowable range of -40 deg Celsius to 150 deg Celsius	Measured diode feedback voltage equals: Greater than 1.5 volts	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
TEMP_SEN S_3_OUT_OF_RAN GE_LOW	C05B3	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	• The temp sensor diode feedback is monitored to check if the temperature is within the allowable range of -40 deg Celsius to 150 deg Celsius	Measured diode feedback voltage equals: Less than 0.7 volts	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
TEMP_SEN S_3_ERRATIC_FAULT	C05B7	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	Record the measured temperature as previous value. At next loop, calculate the absolute difference between the current and previous measured temperature and check if the diff is greater than 20 degree C.	The measured temperature absolute difference between current loop and previous loop is larger than 20 degree C	• Power switch is on and Input validation for Diode temp sensor is true	200 msec	Type B. MIL Illumination.
TEMP_SENS_3_CORRELATION_FAILURE	C05B6	This monitor checks if: • Temperature not within acceptable range • PCB defect • ADC problem • micro problem	Caculate the absolute difference between the measured temperature and micro die temperature	the absolute diff >= 50 degree C	• Power switch is on and Input validation for Diode temp sensor is true	60 msec	Type B. MIL Illumination.
DIE_TEMP ERATURE_CORRELATION_FAULT	P25C6	This monitor checks if: • Defective DIE temperature sensor • Defective PCB sensor (diode) • ADC fault	The main micro controller temperature feedback is compared with the dual series switching diodes. Fault is detected, if the difference between the temperatures exceeds 36.901°C.	The main micro controller temperature feedback is compared with the dual series switching diodes. Fault is detected, if the difference between the temperatures exceeds 36.901 °C.	• DIE sensor measured temperature is in range	5000 msec	Type B. MIL Illumination.
Group 50 - Debug Only Faults							
MISSING_F LY_B ACK_D IOD E_FAU LT	U3000	This monitor checks if: • Fly Back Diode is Missing	• This fault only runs if SW is compiled with DEVEL on	SW detects that a fly back diode is missing	• Power Switch is ON	1 count	Type C, No MIL, "Emissions Neutral Diagnostic "

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Longitudinal Acceleration Sensor Circuit Low	C0553	Controller specific analog circuit diagnoses the raw longitudinal acceleration signal for a short to ground or open fault by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral longitudinal acceleration signal = 0.0 g.	raw longitudinal acceleration signal when sensor type is directly proportional OR raw longitudinal acceleration signal when sensor type is inversely proportional update raw longitudinal acceleration signal stability time, fail and sample time, 50 millisecond update rate	< -3.8500 g > -3.8500 g (< 0.5 Q impedance between signal and controller ground)	battery voltage run crank voltage diagnostic monitor enable sensor type is either directly proportional or inversely proportional U0073 fault active U0073 test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = CeLATR_e_VoltageDirectProp = FALSE = FALSE	raw longitudinal acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral "Emissions Neutral Diagnostic - Type C"

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Longitudinal Acceleration Sensor Circuit High	C0554	Controller specific analog circuit diagnoses the raw longitudinal acceleration signal for a short to power or open fault by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral longitudinal acceleration signal = 0.0 g.	raw longitudinal acceleration signal when sensor type is directly proportional OR raw longitudinal acceleration signal when sensor type is inversely proportional update raw longitudinal acceleration signal stability time, fail and sample time, 50 millisecond update rate	> 3.8500 g < 3.8500 g (< 0.5 Q impedance between signal and controller power)	battery voltage run crank voltage diagnostic monitor enable sensor type is either directly proportional or inversely proportional U0073 fault active U0073 test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = CeLATR_e_VoltageDirectProp = FALSE = FALSE	raw longitudinal acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral "Emissions Neutral Diagnostic - Type C"

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lateral Acceleration Sensor Circuit Low	C0697	Controller specific analog circuit diagnoses the raw lateral acceleration signal for a short to ground or open fault by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral acceleration signal = 0.0 g.	raw lateral acceleration signal when sensor type is directly proportional OR raw lateral acceleration signal when sensor type is inversely proportional update raw lateral acceleration signal stability time, fail and sample time, 50 millisecond update rate	< -3.8500 g > -3.8500 g (< 0.5 Q impedance between signal and controller ground)	battery voltage run crank voltage diagnostic monitor enable sensor type is either directly proportional or inversely proportional U0073 fault active U0073 test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = CeLATR_e_VoltageDirectProp = FALSE = FALSE	raw lateral acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral "Emissions Neutral Diagnostic - Type C"

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lateral Acceleration Sensor Circuit High	C0698	Controller specific analog circuit diagnoses the raw lateral acceleration signal for a short to power or open fault by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral acceleration signal = 0.0 g.	raw lateral acceleration signal when sensor type is directly proportional OR raw lateral acceleration signal when sensor type is inversely proportional update raw lateral acceleration signal stability time, fail and sample time, 50 millisecond update rate	> 3.8500 g < 3.8500 g (< 0.5 Q impedance between signal and controller power)	battery voltage run crank voltage diagnostic monitor enable sensor type is either directly proportional or inversely proportional U0073 fault active U0073 test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = CeLATR_e_VoltageDirectProp = FALSE = FALSE	raw lateral acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral "Emissions Neutral Diagnostic - Type C"

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lateral Acceleration Sensor Performance	C0699	Controller specific analog circuit diagnoses the raw lateral acceleration signal for a signal value that is stuck in a valid range by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral acceleration signal = 0.0 g.	ABS(raw lateral acceleration signal) AND ABS(raw lateral acceleration signal) update raw lateral acceleration signal fail, 50 millisecond update rate	> 0.5300 g < 3.8500 g	battery voltage run crank voltage diagnostic monitor enable update raw lateral acceleration signal stablity time: TOSS vehicle speed automatic transmission is clutch to clutch OR dual clutch high side drive 1 enable high side drive 2 enable diagnsotic fault sequence gear active P0716 fault active P0716 test fail this key on P0717 fault active P0717 test fail this key on P07BF fault active P07BF test fail this key on P07C0 fault active P07C0test fail this key on attained gear ABS(raw lateral acceleration signal) update sample time U0073 fault active U0073 test fail this key on DTCs not fault active	> 11.00 volts > 11.00 volts = 1 Boolean > 15.0 KPH = TRUE = TRUE = TRUE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1st thru 10th < 0.5300 g = FALSE = FALSE VehicleSpeedSensor_FA	raw lateral acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissio ns Neutral "Emissio ns Neutral Diagnost ic - Type C"

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Camshaft System Performance - Bank 1	P0011	Detects a VVT system error by comparing the desired and actual cam positions when WT is activated.	Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive.	(Intake cam Bank 1) Cam Position Error > (**P0011_CamPosErrorLimId**) deg	**Intake Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 Volts = TRUE = FALSE > 0 deg > (**P0011_CamPosErrorLimIc1**) deg AND < **(CalculatedPerfMaxId)** deg < 3.00 deg for (**P0011_P05CC_StablePositionTimeId**) seconds P0010 P2088 P2089	135.00 failures out of 150.00 samples 100 ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Camshaft Actuator Solenoid Circuit Open - Bank 1	P0013	Controller specific output driver circuit diagnoses the CAM phaser oil control valve solenoid high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 200 K Q impedance between signal and controller ground.	P0013is Enabled System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Camshaft System Performance - Bank 1	P0014	Detects a VVT system error by comparing the desired and actual cam positions when WT is activated.	Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive.	(Exhaust cam Bank 1) Cam Position Error > (**P0014_CamPosErrorLimEd**) deg	**Exhaust Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 Volts = TRUE = FALSE > 0 deg > (**P0014_CamPosErrorLimEc1**) deg AND < **(CalculatedPerfMaxEd)** deg <3.00 deg for (**P0014_P05CE_StablePositionTimeEd**) seconds P0013 P2090 P2091	135.00 failures out of 150.00 samples 100 ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 SensorA	P0016	Detects cam to crank misalignment by monitoring if the cam sensor pulse for bank 1 sensor A occurs during the incorrect crank position, diagnostic passes when the cam sensor pulse is in the expected range	Out of range cam edge measurements in one engine cycle Out of range values are: cam edge measurement OR cam edge measurement from the expeced nominal cam position	>= 4 cam edges < -8.5 Crank Degrees >12.1 Crank Degrees	Crankshaft and camshaft position signals are synchronized Engine is Spinning Cam phaser control indcates the phaser is 'parked' No Active DTCs: Time since last execution of a test IntCamECCjDilPresLow	Test is Enabled CrankSensor_FA P0340, P0341 > 1.0 sec = FALSE	4 cam edge measurements and 1 test sample per engine cycle Test failure is 4 fails in 5 samples Diagnostic failure is 2 failed tests out of 3 If the first test fails, the next test is delayed to confirm the phaser 'parked' This delay time is defined by **P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold** For mid-park phasers, an additional delay **P0016-0019 Mid-Park Phaser Delay** is applied	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 Sensor B	P0017	Detects cam to crank misalignment by monitoring if the cam sensor pulse for bank 1 sensor B occurs during the incorrect crank position, diagnostic passes when the cam sensor pulse is in the expected range	Out of range cam edge measurements in one engine cycle Out of range values are: cam edge measurement OR cam edge measurement from the expeced nominal cam position	>= 4 cam edges < -8.3 Crank Degrees >11.7 Crank Degrees	Crankshaft and camshaft position signals are synchronized Engine is Spinning Cam phaser control indcates the phaser is 'parked' No Active DTCs: Time since last execution of a test ExhCamECC_OilPresLow	Test is Enabled CrankSensor_FA P0365, P0366 > 1.0 sec = FALSE	4 cam edge measurements and 1 test sample per engine cycle Test failure is 4 fails in 5 samples Diagnostic failure is 2 failed tests out of 3 If the first test fails, the next test is delayed to confirm the phaser 'parked' This delay time is defined by **P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold** For mid-park phasers, an additional delay **P0016-0019 Mid-Park Phaser Delay** is applied	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft - Sprocket Correlation Diagnostic	P0017 and P0016	On engines with a dual intermediate sprocket between the crankshaft and the camshafts, this diagnostic detects a timing misalignment between the crankshaft, sprocket and camshafts that will cause the bank 1 camshafts to be misaligned.	Out of range cam edge measurements in one engine cycle Out or range values are: (Bank 1 Cam Sensor A) cam edge measurement OR cam edge measurement OR (Bank 1 Cam Sensor B) cam edge measurement OR cam edge measurement from the expected nominal cam position	>= 8 cam edges < -7.0 Crank Degrees > 9.0 Crank Degrees < -7.0 Crank Degrees > 9.0 Crank Degrees	Crankshaft and camshaft position signals are synchronized Engine is Spinning Cam phaser control indcates the phasers are 'parked' No Active DTCs: Time since last execution of a test IntCamECCjDilPresLow ExhCamECC_OilPresLow	Testis Disabled CrankSensor_FA P0340, P0341 P0365, P0366 > 1.0 sec = FALSE = FALSE	8 cam edge measurements and 1 test sample per engine cycle Test failure is 1 fail(s) in 10 samples. Diagnostic failure is 2 failed tests out of 3 If the first test fails, the next test is delayed to confirm the phasers 'parked' This delay time is defined by **P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold** For mid-park phasers, an additional delay **P0016-0019 Mid-Park Phaser Delay** is applied	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Heater Control Circuit Bank 1 Sensor 1	P0030	Controller specific output driver circuit diagnoses the heater output low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 200 K Q impedance between output and controller ground.	Diagnostic is Enabled Ignition Voltage Engine Speed	= Crank or Run >11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controllers P0031 may also set

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Heater Control Circuit Bankl Sensori	P0031	Controller specific output driver circuit diagnoses the heater output low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 0.5 Q impedance between output and controller ground.	Diagnostic is Enabled Ignition Voltage Engine Speed	= Crank or Run >11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0030 may also set

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Heater Control Circuit Bankl Sensori	P0032	Controller specific output driver circuit diagnoses the heater output low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 0.5 Q impedance between output and controller power.	Diagnostic is Enabled Ignition Voltage Engine Speed	= Crank or Run >11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbo/Super Charger Bypass Valve A Control Circuit	P0033	Controller specific output driver circuit diagnostic, diagnosing the 'compressor recirculation valve 'A' actuator' low sided driver for an open circuit failure, when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A' is associated with engine bank 1.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 200 K Q impedance between output and controller ground	Diagnostic enabled ********** Powertrain relay voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts **********	10 failures out of 12 samples PWM CRV: 100ms /sample eCRV: 12.5ms /sample	Type A, 1 Trips Note: In certain controlle rs P0034 may also set turbo/ super charger bypass valve control circuit low

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbo/Super Charger Bypass Valve A Control Circuit Low	P0034	Controller specific output driver circuit diagnostic, diagnosing the 'compressor recirculation valve 'A' actuator' low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. In series application, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A' is associated with engine bank 1.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground. In certain controllers this diagnosis runs only when the HWIO-output is driven by the application S/W.	< 0.5 Q impedance between output and controller ground	Diagnostic Enabled ********** Powertrain relay voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts **********	10 failures out of 12 samples PWM CRV: 100ms /sample eCRV: 12.5ms /sample	Type A, 1 Trips Note: In certain controllers P0033 may also set turbo/ super charger bypass balve control circuit

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbo/Super Charger Bypass Valve A Control Circuit High	P0035	Controller specific output driver circuit diagnostic, diagnosing the 'compressor recirculation valve 'A' actuator' low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds. In series application, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A' is associated with engine bank 1.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power. In certain controllers this diagnosis runs only when the HWIO-output is driven by the application S/W.	< 0.5 Q impedance between output and controller power.	Diagnostic enabled ********** Powertrain relay voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts **********	10 failures out of 12 samples PWM CRV: 100ms /sample eCRV: 12.5ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Heater Control Circuit Bank 1 Sensor 2	P0036	Controller specific output driver circuit diagnoses the heater output low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 200 K Q impedance between output and controller ground.	Diagnostic is Enabled Ignition Voltage Engine Speed	= Crank or Run >11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controllers P0037 may also set

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Heater Control Circuit Bankl Sensor2	P0037	Controller specific output driver circuit diagnoses the heater output low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 0.5 Q impedance between output and controller ground.	Diagnostic is Enabled Ignition Voltage Engine Speed	= Crank or Run >11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0036 may also set

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Heater Control Circuit Bankl Sensor2	P0038	Controller specific output driver circuit diagnoses the heater output low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 0.5 Q impedance between output and controller power.	Diagnostic is Enabled Ignition Voltage Engine Speed	 = Crank or Run >11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
MAP / MAF / Throttle Position Correlation	P0068	Detect when MAP and MAF do not match estimated engine airflow as established by the TPS	Difference between MAP and estimated MAP exceeds threshold (kPa), or P0651 (5 Volt Ref), or P0107 (MAP circuit low), or P0108 (MAP circuit high) have failed this key cycle, then MAP portion of diagnostic fails Absolute difference between MAF and estimated MAF exceed threshold (grams/sec), or P0102 (MAF circuit low), or P0103 (MAF circuit hi) have failed this key cycle, or maximum MAF versus RPM (Table) is greater than or equal to maximum MAF versus battery voltage, then MAF portion of diagnostic fails	Table, f(TPS). See supporting tables: **P0068_Delta MAP Threshold f(TPS)** Table, f(TPS). See supporting tables: **P0068_Delta MAF Threshold f(TPS)** Table, f(RPM). See supporting tables: **P0068_Maximum MAF f(RPM)** Table, f(Volts). See supporting tables: **P0068_Maximum MAF f(Volts)**	Engine Speed Relay voltage	> 800 RPM > 6.41 Volts	Continuously fail MAP and MAF portions of diagnostic for 0.1875 s Continuous in MAIN processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Outside Air Temperature (OAT) Sensor Circuit Performance	P0071	Detects an Outside Air Temperature (OAT) sensorthat is stuck in range. There are two components to the test: an engine off component, and an engine running component. If the engine has been off for a long enough period of time, and the coolant temperature and Intake Air Temperature (IAT) values are similar, then the air temperature values in the engine compartment of the vehicle are considered to have equalized. In this case, the engine off component of the diagnostic can be enabled. If the IAT and the OAT values are similar, then the OAT Performance Diagnostic passes. If the IAT and OAT values are not similar, the diagnostic will continue to monitor the IAT and the OAT as the vehicle starts to move. For applications that have ability to move without engaging the internal combustion	**<u>Engine Off:</u>** If IAT >= OAT: IAT - OAT If IAT < OAT: OAT - IAT If either of the following conditions are met, this diagnostic will pass: If IAT >= OAT: IAT - OAT If IAT < OAT: OAT - IAT	 > 15.0 deg C > 15.0 deg C <= 15.0 deg C <= 15.0 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Engine is not running Vehicle Speed Coolant Temperature - IAT IAT - Coolant Temperature OAT-to-IAT engine off equilibrium counter The "OAT-to-IAT engine off equilibrium counter" is a counter that is incremented or decremented based on vehicle speed when the engine is off. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. The value that is added or subtracted to the counter every 100 msec is contained in table **P0071: OAT Performance Drive Equilibrium Engine Off** No Active DTCs:	 >= 28,800.0 seconds >= 15.5 MPH < 15.0 deg C < 15.0 deg C >= 300.0 counts VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA MAF_SensorFA	Executed every 100 msec until a pass or fail decision is made	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		engine, the engine off test will continue. If the vehicle has been moving quickly enough for a long enough period of time, the IAT and OAT values should have reached an equilibrium. This period of time is defined by the "OAT-to-IAT engine off equilibrium counter". The "OAT-to-IAT engine off equilibrium counter" is a counter that is incremented or decremented based on vehicle speed when the engine is off. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. While the "OAT-to-IAT engine off equilibrium counter" is counting, IAT and OAT are monitored for similarity. If they are similar, the OAT Performance Diagnostic passes. If the counter reaches an equilibrium and the IAT and OAT values are not similar, the OAT Performance Diagnostic will fail.				EngineModeNotRunTimerError		
			Engine Running: If IAT >= OAT: IAT - OAT If IAT < OAT: OAT - IAT If either of the following conditions are met, this diagnostic will pass: If IAT >= OAT: IAT - OAT If IAT < OAT: OAT - IAT	> 15.0 deg C > 15.0 deg C <= 15.0 deg C <= 15.0 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Engine is running Vehicle Speed Engine airflow OAT-to-IAT engine running equilibrium counter The "OAT-to-IAT engine running equilibrium counter" is a counter that is incremented or decremented based on vehicle speed and engine air flow when the engine is running. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. The value that is added or subtracted to the counter every 100 msec is contained in table **P0071: OAT Performance Drive Equilibrium Engine Running** No Active DTCs:	>= 28,800.0 seconds >= 15.5 MPH >= 10.0 grams/second >= 300.0 counts VehicleSpeedSensor_FA	Executed every 100 msec until a pass or fail decision is made	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		If the engine off component of the diagnostic was enabled, but did not make a pass or fail decision, the engine running component will begin executing when the internal combustion engine starts to run. If the vehicle has been moving quickly enough fora long enough period of time, the IAT and OAT values should have reached an equilibrium. This period of time is defined by the "OAT-to-IAT engine running equilibrium counter". The "OAT-to-IAT engine running equilibrium counter" is a counter that is incremented or decremented based on vehicle speed when the engine is running. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. While the "OAT-to-IAT engine running equilibrium counter" is counting, IAT and OAT are monitored for				IAT_SensorFA ECT_Sensor_Ckt_FA MAF_SensorFA EngineModeNotRunTimer Error		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		similarity. If they are similar, the OAT Performance Diagnostic passes. If the counter reaches an equilibrium and the IAT and OAT values are not similar, the OAT Performance Diagnostic will fail.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Outside Air Temperature (OAT) Sensor Circuit Low	P0072	Detects a continuous short to ground in the Outside Air Temperature (OAT) signal circuit by monitoring the OAT sensor output resistance and failing the diagnostic when the OAT resistance is too low. The OAT sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A lower resistance is equivalent to a higher temperature.	Raw OAT Input	<= 46 Ohms (-150 deg C)	Diagnostic is Enabled		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Outside Air Temperature (OAT) Sensor Circuit High	P0073	Detects a continuous open circuit in the Outside Air Temperature (OAT) signal circuit by monitoring the OAT sensor output resistance and failing the diagnostic when the OAT resistance is too high. The OAT sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A higher resistance is equivalent to a lower temperature.	Raw OAT Input	>= 427,757 Ohms (~-60 deg C)	Diagnostic is Enabled		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Outside Air Temperature (OAT) Sensor Intermittent In-Range	P0074	Detects a noisy or erratic signal in the OAT circuit by monitoring the OAT sensor and failing the diagnostic when the OAT signal has a noisier output than is expected. When the value of the OAT signal in °C is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of OAT readings. The result of this summation is called a “string length”. Since the OAT signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic OAT signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current OAT reading - OAT reading from 100 milliseconds previous)	> 100 deg C 10 consecutive OAT readings	Diagnostic is Enabled		4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module SIDI High Pressure Pump min/ max authority	P0089	This DTC determines when the high pressure pump control has reached to its max or min authority	High Pressure Fuel Pump Delivery Angle OR High Pressure Fuel Pump Delivery Angle	>= 92° <= 0°	High Pressure Pump Performance Diagnostic Enable Battery Voltage Low Side Fuel Pressure Barometric Pressure Inlet Air Temp Fuel Temp Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP orTFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) andCam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In	True >=11 Volts > 0.300 MPa Enabled when a code clear is not active or not exiting device control Engine is not cranking >= 70.0 KPA >= -20.0 degC -20 <= Temp degC <= 126	Windup High/ Low 10.00 seconds failures out of 12.50 Seconds samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true andManufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
High Pressure Pump Control Solenoid Enable Low Side Open Circuit	P0090	Controller specific output driver circuit diagnoses High Pressure pump Control Solenoid low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	>= 200 KOhms impedance between signal and controller ground	Engine Speed Battery Voltage	>= 50 RPM >=11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
High Pressure Pump Control Solenoid Enable Low Side Short to Ground	P0091	Controller specific output driver circuit diagnoses High Pressure pump Control Solenoid low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 0.1 Amps between signal and controller ground	Engine Speed Battery Voltage	>=50 RPM >=11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
High Pressure Pump Cntrl Solenoid Enable Low Side Short to Power	P0092	Controller specific output driver circuit diagnoses diagnoses High Pressure pump Control Solenoid low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 1.1 or 15 Amps selectable thershold based on High pressure Pump .	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 2 Circuit Performance (applications with humidity sensor and manifold temperature sensor)	P0096	Detects an Intake Air Temperature 2 (IAT2) sensor value that is stuck in range by comparing the IAT2 sensor value against the IAT and IAT3 sensor values and failing the diagnostic if the IAT2 value is more different than the IAT and IAT3 values than is expected. If the engine has been off for a long enough period of time, the air temperature values in the engine compartment of the vehicle are considered to have equalized, and the diagnostic can be enabled. The diagnostic will fail if the IAT and IAT3 values are similar, and the IAT2 value is not similar to the IAT and IAT3 values. The diagnostic will also fail if none of the three sensor values are similar to each other, and the IAT2 value is furthest from the sensor value that is in the middle of the three sensor values. This diagnostic is executed once per	**Good Correlation Between IAT and IAT3:** ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	> 30 deg C <= 25 deg C > 25 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimerError	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Not Good Correlation, IAT in middle: Power Up IAT is between Power Up IAT2 and Power Up IAT3 AND ABS(Power Up IAT2 - Power Up IAT3) AND ABS(Power Up IAT - Power Up IAT2) > ABS(Power Up IAT - Power Up IAT3)	> 25 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimerError	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		ignition cycle if the enable conditions are met.	**Not Good Correlation, IAT3 in middle:** Power Up IAT3 is between Power Up IAT and Power Up IAT2 AND ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT3 - Power Up IAT2) > ABS(Power Up IAT3 - Power Up IAT)	> 30 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit 2 Low (applications with LIN MAF)	P0097	Detects an erroneously low value being reported over the LIN serial connection from the Intake Air Temperature 2 (IAT2) sensor. The diagnostic monitors the IAT2 sensor output temperature and fails the diagnostic when the IAT2 temperature is too low. The IAT2 sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. The temperature value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	IAT 2 Temperature	< -60 degrees C	Diagnostic is Enabled Powertrain Relay Voltage for a time LIN communications established with MAF No Active DTCs:	 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit 2 High (applications with LIN MAF)	P0098	Detects an erroneously high value being reported over the LIN serial connection from the Intake Air Temperature 2 (IAT2) sensor. The diagnostic monitors the IAT2 sensor output temperature and fails the diagnostic when the IAT2 temperature is too high. The IAT2 sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. The temperature value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	IAT 2 Temperature	> 150 degrees C	Diagnostic is Enabled Powertrain Relay Voltage for a time LIN communications established with MAF No Active DTCs:	 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 2 Intermittent In-Range (applications with humidity)	P0099	Detects a noisy or erratic signal in the Intake Air Temperature 2 (IAT2) circuit by monitoring the IAT2 sensor and failing the diagnostic when the IAT2 signal has a noisier output than is expected. When the value of the IAT2 signal in °C is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of IAT2 readings. The result of this summation is called a “string length”. Since the IAT2 signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic IAT2 signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT2 reading - IAT 2 reading from 100 milliseconds previous)	> 100.00 deg C 10 consecutive IAT 2 readings	Diagnostic is Enabled Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Radiator Coolant Temperature Sensor Performance (HEAT)	P00B2	This DTC detects either a biased high or low RCT (Radiator Coolant Temperature) sensor. This is done by comparing the RCT sensor output to two other temperature sensor outputs after a soak condition.	This sensor is compared to two other sensors for this diagnostic to function. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: RadiatorCoolantTempSnsr Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6		Diagnostic is Enabled No Active DTC's Propulsion system Inactive timer error Sensor under diagnosis is not faulted Used comparison sensors are not currently faulted: - BiasChkCylHdCIntSnsr - BiasChkBlockCIntSnsr - BiasChkEngInCIntSnsr - BiasChkEngOutCIntSnsr - BiasChkHtrCrInCIntSnsr - BiasChkHtrCrOutCInSnsr - BiasChkRadOutCIntSnsr - BiasChkBypInCIntSnsr - BiasChkEngMetalSnsr - BiasChkIntakeAirSnsr - BiasChkHumTmpSnsr - BiasChkManfldAirSnsr - BiasChkOutsideAirSnsr - BiasChkEngOilSnsr - BiasChk_EGR_UpStrmSnsr -	OAT_PtEstFiltFA PSAR_PropSyslnactveCrs_FA = FALSE EECR_RadiatorOutlet_CktFA EECR_CylHeadCoolant_CktFA EECR_BlockCoolant_CktFA EECR_EngineInlet_CktFA EECR_EngineOutlet_CktFA EECR_HeaterCoreInlet_CktFA EECR_HeaterCoreOutlet_CktFA EECR_RadiatorOutlet_CktFA EECR_BypassInlet_CktFA EECR_CylHeadMetal1_CktFA IAT_SensorFA HumTempSnsrFA MnfdTempSensorFA OAT_AmbientSensorFA EngOilTempFA EGRTempSensorUPSS_FA	1 failure to set DTC 1 sec/ sample Once per valid cold start	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			The comparison sensors, temperature thresholds, and aux heater effects can be looked up by finding the location associated with the physical (Temperature) sensor number. **Engine Block:** CeEECR_e_PhysSnsr7 Comparison sensor 1: CeEECR_e_BiasChkCylHdCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkEngOilSnsr Block Heater: CeEECR_e_AuxHeaterBiasHigh Threshold A: Threshold B: **Engine Inlet:** CeEECR_e_PhysSnsr2 Comparison sensor 1: CeEECR_e_BiasChkBlockCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkRadOutCIntSnsr Block Heater: CeEECR_e_AuxHeaterBiasLow Threshold A: Threshold B: **Head Coolant:** CeEECR_e_PhysSnsr6	15.77 °C 7.45 °C 11.15°C 8.66 °C	BiasChk_EGR_DwnStmSnsr - BiasChk_EGR_LowPrsSnsr - BiasChkFuelSnsr - BiasChk_EGRCoolerOutlet Comparison sensors ========== The following thresholds are based on the sensor under diagnosis **Engine Block:** Propulsion Off Soak Time Ambient Air Temperature **Engine Inlet:** Propulsion Off Soak Time Ambient Air Temperature **Head Coolant:** Propulsion Off Soak Time Ambient Air Temperature **Radiator Outlet:** Propulsion Off Soak Time Ambient Air Temperature ========== Comparison sensor 1 & 2 are not	EGRTempSensorDNSS_FA LPE_TempSnsrFA HRTR_b_FuelSensor_FA_Bndl EECR_EGRCoolerOutletCoolant_FA = Availible >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C =		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Comparison sensor 1: CeEECR_e_BiasChkBlockClntSnsr Comparison sensor 2: CeEECR_e_BiasChkEngInCIntSnsr Block Heater: CeEECR_e_AuxHeaterBiasBoth Threshold A: Threshold B: **Radiator Outlet:** CeEECR_e_PhysSnsr3 Comparison sensor 1: CeEECR_e_BiasChkEngInCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkBlockClntSnsr Block Heater: CeEECR_e_AuxHeaterBiasLow Threshold A: Threshold B: A failure will be reported if any of the following conditions are met. Evaluated in order: 1) This sensor is above both comparison sensors 2) This sensor is below both comparison sensors 3) This sensor is	16.20 °C 7.55 °C	========== Aux Heat Detection Aux heat detection can only be enabled the following are met: No Active DTCs At power-up a warm sensor and cool sensor are compared Warm sensor Cool sensor If the warm sensor is compared to the cool sensor Propulsion Off Soak Time Engine Off Soak Time Ambient Air Temperature There are 4 different types of aux heater detection for this application: 2x2 signature Absolute Drop IAT Drop Temperature Derivative	CeEECR_e_BiasChkNoSelection Same set as listed above and EngineModeNotRunTimerError EngineModeNotRunTimer_FA VehicleSpeedSensor_FA CeAEHR_e_BlkHtrBlockClntSnsr CeAEHR_e_BlkHtrRadOutCIntSnsr >10.00 °C >21,600 seconds >21,600 seconds >-20.00 °C Enabled Enabled Disabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			above both comparison sensors and an aux heat source has not been detected to cause this skew 4) This sensor is below both comparison sensors and an aux heat source has not been detected to cause this skew	11.14°C 10.32 °C >A°C >A°C >B°C >B°C	**2x2 Signature Criteria:** The warm sensors Sensor 1: Sensor 2: The cool sensors Sensor 1: Sensor 2: A block heater will be detected if the warm sensors are within AND The cool sensors are within AND The delta between the two groups (warm/cold) **Absolute Drop Criteria:** The is monitored for a drop. The drop will be monitored for once coolant flow is AND Flow time is between AND either Engine runtime is OR Insufficent coolant flow is present for	Disabled CeAEHR_e_BlkHtrBlock ClntSnsr CeAEHR_e_BlkHtrCylHd ClntSnsr CeAEHR_e_BlkHtrRadO utCIntSnsr CeAEHR_e_BlkHtrIntake AirSnsr 8.0 °C 5.0 °C >9.0 °C CeAEHR_e_BlkHtrBlock ClntSnsr >2.00 L/min 0.1 -18.0 seconds < 78.0 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					A block heater is detected if a drop is	>300.0 seconds		
					IAT Drop Criteria:	>1.8 °C		
					The sensor will be used as IAT for this method	CeAEHR_e_BlkHtrIntakeAirSnsr		
					A block heater will be detected if:			
					IAT has a drop of during a drive defined by:			
					Drive time	>5.0 °C		
					Vehicle speed	>400.0 seconds		
					Addtional drive time is provided when vehicle speed drops below above threshold as follows	>24.0kph		
					This detection method will abort if the engine is off	0.5 times the seconds with vehicle speed below the threshold above		
					OR			
					Engine runtime	> 180.0 seconds		
					Temperature Derivative Criteria:	> 1,800 seconds		
					Derivative will be monitored using			
					Derivative will be monitored once coolant flow is	CeAEHR_e_BlkHtrBlockClntSnsr		
					AND			
					Flow time is between	>-1.00 L/min		
					AND either			
					Engine runtime is	5.0 -15.0 seconds		
					OR			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Insufficent coolant flow is present for Derivative count will increment if derivative is If counts are a block heater is detected ==========	< 75.0 seconds >300.0 seconds <-0.10°C/sec > 4 counts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Radiator Coolant Temp Sensor Circuit Low Voltage	P00B3	Circuit Continuity This DTC detects a short to ground in the RCT (Radiator Coolant temperature) signal circuit or the RCT sensor. This is accomplished by monitoring the resitance of the circuit. If the resistance goes out of the expected range the DTC is set.	RCT Resistance (@ 150°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: RadCoolantTempSnsr Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NoUseAssg nmnt Temperature Sensor 5: CeEECR_e_NoUseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	< X Ohms X is equal to: Temp Sensor 1: 55 Ohms Temp Sensor 2: 48.0 Ohms Temp Sensor 3: 41.0 Ohms Temp Sensor 4: 55.0 Ohms Temp Sensor 5: 41.1 Ohms Temp Sensor 6: 48.0 Ohms Temp Sensor 7: 48.0 Ohms	Diagnostic is Enabled		5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Radiator Coolant Temp Sensor Circuit High Voltage	P00B4	Circuit Continuity This DTC detects a short to high or open in the RCT (Radiator Coolant temperature) signal circuit or the RCT sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ -60°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: RadCoolantTempSnsr Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	> X Ohms X is equal to: Temp Sensor 1: 175,000 Ohms Temp Sensor 2: 235,000 Ohms Temp Sensor 3: 355,000 Ohms Temp Sensor 4: 174,069 Ohms Temp Sensor 5: 354,669 Ohms Temp Sensor 6: 235,000 Ohms Temp Sensor 7: 235,000 Ohms	Diagnostic is Enabled Engine run time OR IAT min	 > 10.0 seconds > -20.0 °C	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Radiator Coolant Temperature Sensor Circuit Intermittent/ Erratic	P00B5	Circuit Erratic This DTC detects large step changes in the RCT (Radiator Coolant temperature) signal circuit or the RCT sensor. Allowable high and low limits are calculated for the next sample based on the previous sample and sensor time constant. If the sensor responds faster than should be possible the DTC is set.	Temperature step change: 1) postive step change is greater than calculated high limit OR 2) negitive step change is lower than calculated low limit. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: RadCoolantTempSnsr Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt		Diagnostic is Enabled No Active DTC's	EECR_RCT_Erratic_TFT KO EECR_RCT_CktHiLo_FA	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6 The calculated high and low limits for the next reading use the following calibrations: Temperature Sensor 1: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 2: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 3: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 4: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 5: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 6: 1) Sensor time constant 2) Sensor low limit 3) Sensor hiqh limit	 7.6 seconds -60.0 °C 200.0 °C 3.3 seconds -60.0 °C 200.0 °C 4.3 seconds -60.0 °C 200.0 °C 5.7 seconds -60.0 °C 200.0 °C 4.5 seconds -60.0 °C 200.0 °C 4.7 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Temperature Sensor 7: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit *****Generic Example***** If the last temp reading was 90 °C, the Time constant was calibrated at 10 seconds, the low limit was calibrated to -80 °C and the high limit was calibrated to 200 °C the calculated limits are 101 °C and 73 °C. The next reading (after the 90 °C reading) must be between 73 °C and 101 °C to be valid. **********	7.3 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
High Pressure Start Diagnostic	P00C6	The DTC Diagnoses the high side fuel pressure during engine cranking.	The ECM detects that the fuel pressure is not rising or has fallen beyond acceptable limits during engine cranking Pressure Rise Test: Sensed High Pressure Fuel Rail Pressure value Pressure Fall Test: Sensed High Pressure Fuel Rail Pressure value	 **P00C6 - Minimum pressure in MPa that will exit High Pressure Start mode and allow fuel delivery** (see Supporting Table) **P00C6 - Minimum acceptable value of fuel rail pressure after High Pressure Start** (see Supporting Table)	High Pressure Rise Diagnostic During Start High Pressure Fall Diagnostic During Start Low side feed fuel pressure Engine Run Time Run/Crank Voltage Engine Coolant For each engine start, only 1 diagnostic is performed. The pressure rise test will run if High side fuel pressure is less than KtFHPC_p_HighPressStart, otherwise, the pressure fall diagnostic will run The pressure fall runs when the engine is cranking.	Enabled Disabled >= 0 KPA < = 1 sec > 8 Volts -100 <= °C <= 126 All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT, IAT2 and ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control	Pressure Rise Test: Crank Time >= **P00C6 - High Pressure Pump Control Mode timeout** (see Supporting Table) 6.25 ms per sample Pressure Fall Test: Injected cylinder events >= **P00C6 - Max acceptable counts of fuel rail pressure after High Pressure Start** (see Supporting Table) 4 samples per engine rotation	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active		
					Barometric Pressure Inlet Air Temp	>= 70.0 KPA >= -20.0 DegC		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Pressure Measurement System - Multiple Sensor Correlation (single turbo)	P00C7	Detects an inconsistency between pressure sensors in the induction system in which a particular sensor cannot be identified as the failed sensor. If the engine has been off for a sufficient amount of time, the pressure values in the induction system will have equalized. The Manifold Pressure (MAP), Turbocharger Boost Pressure and Barometric Pressure (BARO) sensors values are checked to see if they are within the normal expected atmospheric pressure range. If one of the sensors is outside the normal expected atmospheric pressure range, this monitor will fail. Otherwise, MAP, Turbocharger Boost Pressure and BARO are compared to see if their values are similar. If two of these three sensors have similar values, but the third does not, then this monitor will fail. This monitor will also fail if there is no combination	ABS(Manifold Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Manifold Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure) OR ABS(Manifold Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Manifold Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure) OR ABS(Manifold Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Manifold Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure) OR ABS(Manifold Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Manifold Pressure)	> 10.0 kPa <= 10.0 kPa <= 10.0 kPa <= 10.0 kPa > 10.0 kPa <= 10.0 kPa <= 10.0 kPa <= 10.0 kPa <= 10.0 kPa > 10.0 kPa > 10.0 kPa > 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating Manifold Pressure Manifold Pressure Baro Pressure Baro Pressure Turbocharger Boost Pressure Turbocharger Boost Pressure No Active DTCs: No Pending DTCs: Diagnostic is Enabled LIN communications established with MAF	> 10.0 seconds >= 50.0 kPa <= 115.0 kPa >= 50.0 kPa <= 115.0 kPa >= 50.0 kPa <= 115.0 kPa EngineModeNotRunTimerError MAP_SensorFA AAP_SnsrFA AAP2_SnsrFA AAP_LIN1_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP_LIN1_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec for applications without LIN MAF 1 sample every 25 msec for applications with LIN MAF	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		of two of these three sensors reporting similar values and the failed sensor cannot be uniquely identified.	AND ABS(Turbocharger Boost Pressure - Baro Pressure)	> 10.0 kPa				
			Manifold Pressure OR Manifold Pressure OR ABS(Manifold Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Manifold Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure)	< 50.0 kPa > 115.0 kPa > 10.0 kPa > 10.0 kPa <= 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs: Diagnostic is Enabled LIN communications established with MAF	> 10.0 seconds EngineModeNotRunTimerError MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP_LIN1_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP_LIN1_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec for applications without LIN MAF 1 sample every 25 msec for applications with LIN MAF	
			Turbocharger Boost Pressure OR Turbocharger Boost Pressure OR ABS(Manifold Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Manifold Pressure) ■AWS----------	< 50.0 kPa > 115.0 kPa <= 10.0 kPa > 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs:	> 10.0 seconds EngineModeNotRunTimerError MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP_LIN1_SnsrCktFA	4 failures out of 5 samples 1 sample every 12.5 msec for applications without LIN MAF 1 sample every 25 msec for applications with LIN MAF	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			ABS(Turbocharger Boost Pressure - Baro Pressure)	> 10.0 kPa	No Pending DTCs: Diagnostic is Enabled LIN communications established with MAF	MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP_LIN1_SnsrCktFP		
			Barometric Pressure OR Barometric Pressure OR ABS(Manifold Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Manifold Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure)	< 50.0 kPa > 115.0 kPa > 10.0 kPa <= 10.0 kPa > 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs: Diagnostic is Enabled LIN communications established with MAF	> 10.0 seconds EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP_LIN1_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP_LIN1_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec for applications without LIN MAF 1 sample every 25 msec for applications with LIN MAF	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Press Regulator Solenoid Supply Voltage Control High Side Circuit Short to ground	P00C9	Controller specific output driver circuit diagnoses High Pressure pump Control Solenoid high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 1.1 or 15 Amps selectable thershold based on High pressure Pump.	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Press Regulator Solenoid Supply Voltage Control High Side Circuit Short to power	POOCA	Controller specific output driver circuit diagnoses High Pressure pump Control Solenoid high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 0.1 Amps between signal and controller power	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Temperature Sensor "A" Circuit Range/ Performance	POODF	This monitor checks if the CAC inlet water temperature sensor is irrational at key on when compared with two reference temperature sensors after a long soak time	CAC inlet water temperature is compared at power up with an average temperature calculated using the CAC inlet gas temperature sensor and the CAC outlet gas temperature sensor over a calibratable number of samples.		Test enabled by calibration	1.00==TRUE	The averaged temperatures are calculated over 10.00 samples.	Type B, 2 Trips
					Key on and engine not running or engine running for less than a calibratable time	< 2.00 [s]	No debounce is present: DTC sets as soon as the error is present	
			Temperature difference (absolute value)	> 20.00 [°C]	Engine not cranking	==TRUE		
					Runk Crank Relay voltage in range	>11.00 [V]	Function task: at key on	
					The engine has not run for a calibratable time since last key off	>= 28,800.00 [s]		
					No faults detected on engine off timer	EngineModeNotRunTimer Error ==FALSE		
					Absolute value of the difference between CAC inlet gas temperature and CAC outlet gas temperature smaller than a calibratable threshold	< 20.00 [°C]		
					Sensor Performance Check not yet completed in current driving cycle	==TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No faults detected on CAC inlet gas temperature sensor No faults detected on CAC outlet gas temperature sensor No electrical or intermittent faults detected on CAC inlet water temperature sensor	CIT_CAC_UpFA ==FALSE CIT_CAC_DwnFA ==FALSE CIW_TemplnCktFA ==FALSE CIW_TemplnSlfCorFA ==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Temperature Sensor "A" Circuit Low	P00E0	This monitor checks if the CAC inlet water temperature sensor is out of electrical range low	Temperature raw resistance < low threshold	<40.00 [ohm]	Test enabled by calibration Engine not cranking Runk Crank Relay voltage in range	1.00 == TRUE > 11.00 [V]	20.00 fail counts out of 24.00 sample counts Function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Temperature Sensor "A" Circuit High	P00E1	This monitor checks if the CAC inlet water temperature sensor is out of electrical range high	Temperature raw resistance > high threshold	> 80,000.00 [ohm]	Test enabled by calibration Engine not cranking Runk Crank Relay voltage in range	1.00 == TRUE > 11.00 [V]	20.00 fail counts out of 24.00 sample counts Function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Temperature Sensor "A" Intermittent/ Erratic	P00E2	This monitor checks if the CAC inlet water temperature sensor has an intermittent fault.	CAC inlet water temperature value > T_MAX_threshold OR CAC inlet water temperature value < T_MIN_threshold where - T_MAX_threshold = (1 - alpha)*T_MAX + alpha*T_last_good - T_MIN_threshold = (1 - alpha)*T_MIN + alpha*T_last_good - alpha = e^{A}(#fails + 1)*(ts/ tau) - #fails = number of consecutive samples where the test failed - ts = sensor sampling time - tau = sensor filter response time - T_MAX = sensor maximum actual reading - T_MIN = sensor minimum actual reading - T_last_good = last good temperature measured by the sensor	> 200.00 [°C] < -40.00 [°C]	Test enabled by calibration Engine not cranking Run Crank Relay voltage in range No electrical faults detected on CAC inlet water temperature sensor	1.00==TRUE ==TRUE > 11.00 [V] CIW_TemplnCktFA ==FALSE	40.00 fail counter over 50.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 3 Circuit Performance (applications with humidity sensor and manifold temperature sensor)	P00E9	Detects an Intake Air Temperature 3 (IAT3) sensor value that is stuck in range by comparing the IAT3 sensor value against the IAT and IAT2 sensor values and failing the diagnostic if the IAT3 value is more different than the IAT and IAT2 values than is expected. If the engine has been off for a long enough period of time, the air temperature values in the engine compartment of the vehicle are considered to have equalized, and the diagnostic can be enabled. The diagnostic will fail if the IAT and IAT2 values are similar, and the IAT3 value is not similar to the IAT and IAT2 values. The diagnostic will also fail if none of the three sensor values are similar to each other, and the IAT3 value is furthest from the sensor value that is in the middle of the three sensor values. This diagnostic is executed once per ignition cycle if the	**Good Correlation Between IAT and IAT2:** ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	<= 30 deg C > 25 deg C > 25 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time (Engine Coolant Temp - Outside Ambient Temp) No Active DTCs: LIN communications established with MAF	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds <= 25.0 deg C PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Not Good Correlation, IAT in Middle: Power Up IAT is between Power Up IAT2 and Power Up IAT3 AND ABS(Power Up IAT2 - Power Up IAT3) AND ABS(Power Up IAT - Power Up IAT3) > ABS(Power Up IAT - Power Up IAT2)	> 25 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		enable conditions are met.			LIN communications established with MAF			
			Not Good Correlation, IAT2 in Middle: Power Up IAT2 is between Power Up IAT and Power Up IAT3 AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3) > ABS(Power Up IAT2 - Power Up IAT)	> 25 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit 3 Low (applications with manifold temperature and humidity)	POOEA	Detects a continuous short to ground in the Intake Air Temperature 3 (IAT3) signal circuit by monitoring the IAT3 sensor output resistance and failing the diagnostic when the IAT3 resistance is too low. The IAT3 sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A lower resistance is equivalent to a higher temperature.	Raw IAT 3 Input	< 57.94 Ohms (-150 deg C)	Diagnostic is Enabled		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit 3 High (applications with manifold temperature and humidity)	POOEB	Detects a continuous open circuit in the Intake Air Temperature 3 (IAT3) signal circuit by monitoring the IAT3 sensor output resistance and failing the diagnostic when the IAT3 resistance is too high. The IAT3 sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. A higher resistance is equivalent to a lower temperature.	Raw IAT 3 Input	> 153,665 Ohms (~-60 deg C)	Diagnostic is Enabled		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor 3 Intermittent In-Range	POOEC	Detects a noisy or erratic signal in the Intake Air Temperature 3 (IAT3) circuit by monitoring the IAT3 sensor and failing the diagnostic when the IAT3 signal has a noisier output than is expected. When the value of the IAT3 signal in °C is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of IAT3 readings. The result of this summation is called a “string length”. Since the IAT3 signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic IAT3 signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Dir calculated over And where: "Dir =ABS(current IAT3 reading - IAT 3 reading from 100 milliseconds previous)	> 80.00 deg C 10 consecutive IAT 3 readings	Diagnostic is Enabled		4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Humidity Sensor Circuit Low (applications with LIN MAF)	P00F4	Detects an eroneously low value being reported over the LIN serial connection from the humidity sensor. The diagnostic monitors the humidity sensor relative humidity output and fails the diagnostic when the humidity percentage is too low. The humidity sensor converts the capacitance across the sensor to a relative humidity. The relative humidity percentage value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	Relative Humidity	<= -6.25 %	Diagnostic is Enabled Powertrain Relay Voltage for a time LIN communications established with MAF No Active DTCs:	 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Humidity Sensor Circuit High (applications with LIN MAF)	P00F5	Detects an eroneously high value being reported over the LIN serial connection from the humidity sensor. The diagnostic monitors the humidity sensor relative humidity output and fails the diagnostic when the humidity percentage is too high. The humidity sensor converts the capacitance across the sensor to a relative humidity. The relative humidity percentage value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	Relative Humidity	>= 106.25 %	Diagnostic is Enabled Powertrain Relay Voltage for a time LIN communications established with MAF No Active DTCs:	 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Humidity Sensor Circuit Intermittent	P00F6	Detects a noisy or erratic signal in the humidity circuit by monitoring the humidity sensor and failing the diagnostic when the humidity signal has a noisier output than is expected. When the value of relative humidity in % is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of humidity readings. The result of this summation is called a “string length”. Since the humidity signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic humidity signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current Humidity reading - Humidity reading from 100 milliseconds previous)	> 80 % 10 consecutive Humidity readings	Diagnostic is Enabled Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Mass Air Flow System Performance (single turbo)	P0101	Detects a performance failure in the Mass Air Flow (MAF) sensor, such as when a MAF value is stuck in range. This diagnostic is performed using the Intake Flow Rationality Diagnostic (IFRD). IFRD calculates modeled values of sensors from other sensors. The other sensors are the Manifold Pressure (MAP) sensor, Turbocharger Boost Pressure sensor and Throttle Position sensor (TPS). These modeled values are compared against the actual sensor values to see if they are similar. If they are similar, then the model passes. If they are not similar, then that model is considered to be failed. Certain combinations of model passes and model failures can be interpreted to be caused by a performance issue with the MAF sensor. In this case, the MAF Performance diagnostic	See table **P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when ABS(Measured Flow - Modeled Air Flow) Filtered MAPI model fails when ABS(Measured MAP - MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP - MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP - MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP - TIAP Model 1) Filtered TPS model fails when Filtered Throttle Model Error TIAP Correlation model fails when High Engine Air Flow is TRUE AND	> 25.2 grams/sec > 20.0 kPa > 25.0 kPa > 25.0 kPa > 30.5 kPa > 250 kPa*(g/s)	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria (Coolant Temp OR OBD Max Coolant Achieved Intake Air Temp Intake Air Temp Powertrain Relay Voltage for a period of time Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables.	>= 400 RPM <= 5,700 RPM >= -9 Deg C = TRUE) <= 130 Deg C = FALSE) -20 Deg C <= 100 Deg C >= 9.1 Volts >= 0.2 Seconds >= 0.50 Modeled Air Flow Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM and MAF Est** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAPI Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		will fail.	Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is TRUE when Mass Air Flow -	> 30.0 kPa > 30.0 kPa > 1.0 seconds > 1.0 seconds > a threshold in gm/sec as a function of engine speed. See table	No Active DTCs: No Pending DTCs:	**P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA MAF_SensorCircuitFA CrankSensor_FA IAT_SensorFA EECR_EngineArbitrated_FA EECR_EngineOutlet_CktFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault IAT_SensorCircuitFP MnfdTempSensorCktFP		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow	Diagnostic is Enabled			
			AND Manifold Pressure	> a threshold in kPa as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**				
			AND Filtered Mass Air Flow - Mass Air Flow	< 1.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm/sec as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP**				
			AND Mass Air Flow - Filtered Mass Air Flow	< 3.0 gm/sec				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Mass Air Flow Sensor Circuit Low Frequency (all MAF suppliers except for Vitesco)	P0102	Detects a continuous short to ground in the MAF sensor circuit or a MAF sensor that is outputting a frequency that is too low. The diagnostic monitors the MAF sensor frequency output and fails the diagnostic when the MAF frequency is too low. A low MAF frequency is associated with a low engine air flow. The MAF sensor monitors the temperature of a circuit in the airflow of the engine. The temperature of this circuit is related to the mass airflow across the sensor. The mass air flow value is converted by the sensor to a frequency value in Hertz. A digital square wave signal is transmitted by the sensor to the ECM. The ECM calculates the frequency of the square wave signal and converts that frequency to a mass air flow value in grams/second through a transfer function.	MAF Output	<= 1,500 Hertz (<= 0.00 gm/sec)	Engine Run Time Engine Speed Powertrain Relay Voltage Above criteria present for a period of time Diagnostic is Enabled	> 0.0 seconds >= 300 RPM >= 9.1 Volts >= 0.5 seconds	200 failures out of 250 samples 1 sample every cylinder firing event	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Mass Air Flow Sensor Circuit High Frequency (all MAF suppliers except for Vitesco)	P0103	Detects a MAF sensor that is outputting a frequency signal that is too high. The diagnostic monitors the MAF sensor frequency output and fails the diagnostic when the MAF frequency is too high. A high MAF frequency is associated with a high engine air flow. The MAF sensor monitors the temperature of a circuit in the airflow of the engine. The temperature of this circuit is related to the mass airflow across the sensor. The mass air flow value is converted by the sensor to a frequency value in Hertz. A digital square wave signal is transmitted by the sensor to the ECM. The ECM calculates the frequency of the square wave signal and converts that frequency to a mass air flow value in grams/second through a transfer function.	MAF Output	>= 14,449 Hertz (>= 700.2 gm/sec)	Engine Run Time Engine Speed Powertrain Relay Voltage Above criteria present for a period of time Diagnostic is Enabled	> 0.0 seconds >= 300 RPM >= 9.1 Volts >= 0.5 seconds	200 failures out of 250 samples 1 sample every cylinder firing event	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Manifold Absolute Pressure Sensor Performance (single turbo)	P0106	Detects a performance failure in the Manifold Pressure (MAP) sensor, such as when a MAP value is stuck in range. This diagnostic is performed using the Intake Flow Rationality Diagnostic (IFRD). IFRD calculates modeled values of sensors from other sensors. The other sensors are the Mass Air Flow (MAF) sensor, Turbocharger Boost Pressure sensor and Throttle Position sensor (TPS). These modeled values are compared against the actual sensor values to see if they are similar. If they are similar, then the model passes. If they are not similar, then that model is considered to be failed. Certain combinations of model passes and model failures can be interpreted to be caused by a performance issue with the MAP sensor. In this case, the MAP Performance diagnostic	**Engine Running:** See table **P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when ABS(Measured Flow - Modeled Air Flow) Filtered MAPI model fails when ABS(Measured MAP - MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP - MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP - MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP - TIAP Model 1) Filtered TPS model fails when Filtered Throttle Model Error TIAP Correlation model fails when High Engine Air Flow is	> 25.2 grams/sec > 20.0 kPa > 25.0 kPa > 25.0 kPa > 30.5 kPa > 250 kPa*(g/s)	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria (Coolant Temp OR OBD Max Coolant Achieved Intake Air Temp Intake Air Temp Powertrain Relay Voltage for a period of time Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables.	>= 400 RPM <= 5,700 RPM >= -9 Deg C = TRUE) <= 130 Deg C = FALSE) -20 Deg C <= 100 Deg C >= 9.1 Volts >= 0.2 Seconds >= 0.50 Modeled Air Flow Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM and MAF Est** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAPI Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		will fail.	TRUE AND Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is TRUE when Mass Air Flow	> 30.0 kPa > 30.0 kPa > 1.0 seconds > 1.0 seconds > a threshold in gm/sec as a function of engine speed See table	No Active DTCs: No Pending DTCs:	**P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA MAF_SensorCircuitFA CrankSensor_FA IAT_SensorFA EECR_EngineArbitrated_FA EECR_EngineOutlet_CktFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault IAT_SensorCircuitFP MnfdTempSensorCktFP		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			-	**P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow**	Diagnostic is Enabled			
			AND Manifold Pressure	> a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**				
			AND Filtered Mass Air Flow - Mass Air Flow	< 1.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm/sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP**				
			AND Mass Air Flow - Filtered Mass Air Flow	< 3.0 gm/sec				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Manifold Absolute Pressure Sensor Circuit Low	P0107	Detects a continuous short to ground in the Manifold Absolute Pressure (MAP) signal circuit by monitoring the MAP sensor output voltage and failing the diagnostic when the MAP voltage is too low. The MAP sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	MAP Voltage	< 3.3 % of 5 Volt Range (This is equal to 7.5 kPa)	Diagnostic is Enabled		320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Manifold Absolute Pressure Sensor Circuit High	P0108	Detects a continuous short to power or open circuit in the Manifold Absolute Pressure (MAP) signal circuit by monitoring the MAP sensor output voltage and failing the diagnostic when the MAP voltage is too high. The MAP sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	MAP Voltage	> 78.0% of 5 Volt Range (This is equal to 336.0 kPa)	Diagnostic is Enabled		320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit Performance (applications with humidity sensor and manifold temperature sensor)	P0111	Detects an Intake Air Temperature (IAT) sensor value that is stuck in range by comparing the IAT sensor value against the IAT2 and IAT3 sensor values and failing the diagnostic if the IAT value is more different than the IAT2 and IAT3 values than is expected. If the engine has been off for a long enough period of time, the air temperature values in the engine compartment of the vehicle are considered to have equalized, and the diagnostic can be enabled. The diagnostic will fail if the IAT2 and IAT3 values are similar, and the IAT value is not similar to the IAT2 and IAT3 values. The diagnostic will also fail if none of the three sensor values are similar to each other, and the IAT value is furthest from the sensor value that is in the middle of the three sensor values. This diagnostic is executed once per	**Good Correlation Between IAT2 and IAT3** ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	> 30 deg C > 25 deg C <= 25 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimerError	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Not Good Correlation, IAT2 in Middle: Power Up IAT2 is between Power Up IAT and Power Up IAT3 AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT) > ABS(Power Up IAT2 - Power Up IAT3)	> 25 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimerError	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		ignition cycle if the enable conditions are met.	**Not Good Correlation, IAT3 in Middle:** Power Up IAT3 is between Power Up IAT and Power Up IAT2 AND ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT3 - Power Up IAT) > ABS(Power Up IAT3 - Power Up IAT2)	> 30 deg C	Diagnostic is Enabled Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs: LIN communications established with MAF	> 28,800 seconds >=11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA EngineModeNotRunTimer Error	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit Low (applications with LIN MAF)	P0112	Detects an erroneously low value being reported over the LIN serial connection from the Intake Air Temperature (IAT) sensor. The diagnostic monitors the IAT sensor output temperature and fails the diagnostic when the IAT temperature is too low. The IAT sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. The temperature value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	IAT Temperature	< -60 degrees C	Diagnostic is Enabled LIN Communications established with MAF		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Circuit High (applications with LIN MAF)	P0113	Detects an erroneously high value being reported over the LIN serial connection from the Intake Air Temperature (IAT) sensor. The diagnostic monitors the IAT sensor output temperature and fails the diagnostic when the IAT temperature is too high. The IAT sensor is a thermistor in which the resistance across the sensor can be equated to a temperature. The temperature value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	IAT Temperature	> 150 degrees C	Diagnostic is Enabled LIN Communications established with MAF		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Air Temperature Sensor Intermittent In-Range	P0114	Detects a noisy or erratic signal in the Intake Air Temperature (IAT) circuit by monitoring the IAT sensor and failing the diagnostic when the IAT signal has a noisier output than is expected. When the value of the IAT signal in °C is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of IAT readings. The result of this summation is called a “string length”. Since the IAT signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic IAT signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT reading - IAT reading from 100 milliseconds previous)	> 80.00 deg C 10 consecutive IAT readings	Diagnostic is Enabled LIN communications established with MAF		4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor Performance (HEAT)	P0116	This DTC detects either a biased high or low ECT (Engine Coolant temperature) sensor. This is done by comparing the ECT sensor output to two other temperature sensor outputs after a soak condition.	This sensor is compared to two other sensors for this diagnostic to function. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsrl Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6		Diagnostic is Enabled No Active DTC's Propulsion system Inactive timer error Sensor under diagnosis is not faulted Used comparison sensors are not currently faulted: - BiasChkCylHdCIntSnsr - BiasChkBlockCIntSnsr - BiasChkEnglnCIntSnsr - BiasChkEngOutCIntSnsr - BiasChkHtrCrlnCIntSnsr - BiasChkHtrCrOutCInSnsr - BiasChkRadOutCIntSnsr - BiasChkBypInCIntSnsr - BiasChkEngMetalSnsr - BiasChkIntakeAirSnsr - BiasChkHumTmpSnsr - BiasChkManfldAirSnsr - BiasChkOutsideAirSnsr - BiasChkEngOilSnsr - BiasChk_EGR_UpStrmSn	OAT_PtEstFiltFA PSAR_PropSyslnactveCr s_FA = FALSE EECR_EngineOutlet_Ckt FA EECR_CylHeadCoolant_ CktFA EECR_BlockCoolant_Ckt FA EECR_Enginelnlet_CktFA EECR_EngineOutlet_Ckt FA EECR_HeaterCorelnlet_C ktFA EECR_HeaterCoreOutlet _CktFA EECR_RadiatorOutlet_Ck tFA EECR_Bypasslnlet_CktF A EECR_CylHeadMetal1_C ktFA IAT_SensorFA HumTempSnsrFA MnfdTempSensorFA OAT_AmbientSensorFA EngOilTempFA	1 failure to set DTC 1 sec/ sample Once per valid cold start	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			The comparison sensors, temperature thresholds, and aux heater effects can be looked up by finding the location associated with the physical (Temperature) sensor number. **Engine Block:** CeEECR_e_PhysSnsr7 Comparison sensor 1: CeEECR_e_BiasChkCylHdCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkEngOilSnsr Block Heater: CeEECR_e_AuxHeaterBiasHigh Threshold A: Threshold B: **Engine Inlet:** CeEECR_e_PhysSnsr2 Comparison sensor 1: CeEECR_e_BiasChkBlockClntSnsr Comparison sensor 2: CeEECR_e_BiasChkRadOutCIntSnsr Block Heater: CeEECR_e_AuxHeaterBiasLow Threshold A: Threshold B: **Head Coolant:** CeEECR_e_PhysSnsr6 Comparison sensor 1:	15.77 °C 7.45 °C	sr - BiasChk_EGR_DwnStmSnsr - BiasChk_EGR_LowPrsSnsr - BiasChkFuelSnsr - BiasChk_EGRCoolerOutlet Comparison sensors ========== The following thresholds are based on the sensor under diagnosis **Engine Block:** Propulsion Off Soak Time Ambient Air Temperature **Engine Inlet:** Propulsion Off Soak Time Ambient Air Temperature **Head Coolant:** Propulsion Off Soak Time Ambient Air Temperature **Radiator Outlet:** Propulsion Off Soak Time Ambient Air Temperature ========== Comparison sensor 1 & 2 are not	EGRTempSensorUPSS_FA EGRTempSensorDNSS_FA LPE_TempSnsrFA HRTR_b_FuelSensor_FA_Bndl EECR_EGRCoolerOutletCoolant_FA = Availible >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CeEECR_e_BiasChkBlo ckClntSnsr Comparison sensor 2: CeEECR_e_BiasChkEng InClntSnsr Block Heater: CeEECR_e_AuxHeaterBi asBoth Threshold A: Threshold B: **Radiator Outlet:** CeEECR_e_PhysSnsr3 Comparison sensor 1: CeEECR_e_BiasChkEng InClntSnsr Comparison sensor 2: CeEECR_e_BiasChkBlo ckClntSnsr Block Heater: CeEECR_e_AuxHeaterBi asLow Threshold A: Threshold B: A failure will be reported if any of the following conditions are met. Evaluated in order: 1) This sensor is above both comparison sensors 2) This sensor is below both comparison sensors 3) This sensor is above both comparison	11.15°C 8.66 °C 16.20 °C 7.55 °C	========== Aux Heat Detection Aux heat detection can only be enabled the following are met: No Active DTCs At power-up a warm sensor and cool sensor are compared Warm sensor Cool sensor If the warm sensor is compared to the cool sensor Propulsion Off Soak Time Engine Off Soak Time Ambient Air Temperature There are 4 different types of aux heater detection for this application: 2x2 signature Absolute Drop IAT Drop	= CeEECR_e_BiasChkNoS election Same set as listed above and EngineModeNotRunTimer Error EngineModeNotRunTimer _FA VehicleSpeedSensor_FA CeAEHR_e_BlkHtrBlock ClntSnsr CeAEHR_e_BlkHtrRadO utClntSnsr >10.00 °C >21,600 seconds >21,600 seconds >-20.00 °C Enabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			sensors and an aux heat source has not been detected to cause this skew 4) This sensor is below both comparison sensors and an aux heat source has not been detected to cause this skew		Temperature Derivative **2x2 Signature Criteria:** The warm sensors Sensor 1: Sensor 2: The cool sensors Sensor 1: Sensor 2: A block heater will be detected if the warm sensors are within AND The cool sensors are within AND The delta between the two groups (warm/cold) **Absolute Drop Criteria:** The is monitored for a drop. The drop will be monitored for once coolant flow is AND Flow time is between AND either Engine runtime is OR Insufficent coolant flow is present for	Enabled Disabled Disabled CeAEHR_e_BlkHtrBlock ClntSnsr CeAEHR_e_BlkHtrCylHd ClntSnsr CeAEHR_e_BlkHtrRadO utCIntSnsr CeAEHR_e_BlkHtrIntake AirSnsr 8.0 °C 5.0 °C >9.0 °C CeAEHR_e_BlkHtrBlock ClntSnsr >2.00 L/min 0.1 -18.0 seconds < 78.0 seconds		
				11.14°C 10.32 °C >A °C >A °C >B °C >B °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					A block heater is detected if a drop is **IAT Drop Criteria:** The sensor will be used as IAT for this method A block heater will be detected if: IAT has a drop of during a drive defined by: Drive time Vehicle speed Addtional drive time is provided when vehicle speed drops below above threshold as follows This detection method will abort if the engine is off OR Engine runtime **Temperature Derivative Criteria:** Derivative will be monitored using Derivative will be monitored once coolant flow is AND Flow time is between AND either	>300.0 seconds >1.8 °C CeAEHR_e_BlkHtrIntake AirSnsr >5.0 °C >400.0 seconds >24.0kph 0.5 times the seconds with vehicle speed below the threshold above > 180.0 seconds > 1,800 seconds CeAEHR_e_BlkHtrBlock ClntSnsr >-1.00 L/min		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Engine runtime is OR Insufficent coolant flow is present for Derivative count will increment if derivative is If counts are a block heater is detected ==========	5.0 -15.0 seconds < 75.0 seconds >300.0 seconds <-0.10°C/sec > 4 counts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temp Sensor Circuit Low	P0117	Circuit Continuity This DTC detects a short to ground in the ECT (Engine Coolant temperature) signal circuit or the ECT sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ 150°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsrl Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NoUseAssg nmnt Temperature Sensor 5: CeEECR_e_NoUseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	< X Ohms X is equal to: Temp Sensor 1: 55 Ohms Temp Sensor 2: 48.0 Ohms Temp Sensor 3: 41.0 Ohms Temp Sensor 4: 55.0 Ohms Temp Sensor 5: 41.1 Ohms Temp Sensor 6: 48.0 Ohms Temp Sensor 7: 48.0 Ohms	Diagnostic is Enabled		5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temp Sensor Circuit High	P0118	Circuit Continuity This DTC detects a short to high or open in the ECT (Engine Coolant temperature) signal circuit or the ECT sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ -60°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsrl Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	> X Ohms X is equal to: Temp Sensor 1: 175,000 Ohms Temp Sensor 2: 235,000 Ohms Temp Sensor 3: 355,000 Ohms Temp Sensor 4: 174,069 Ohms Temp Sensor 5: 354,669 Ohms Temp Sensor 6: 235,000 Ohms Temp Sensor 7: 235,000 Ohms	Diagnostic is Enabled Engine run time OR IAT min	 > 10.0 seconds > -20.0 °C	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature (ECT) Sensor Circuit Intermittent	P0119	Circuit Erratic This DTC detects large step changes in the ECT (Engine Coolant temperature) signal circuit or the ECT sensor. Allowable high and low limits are calculated for the next sample based on the previous sample and sensor time constant. If the sensor responds faster than should be possible the DTC is set.	Temperature step change: 1) postive step change is greater than calculated high limit OR 2) negitive step change is lower than calculated low limit. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsrl Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7:		Diagnostic is Enabled No Active DTC's	ECT_Sensor_Ckt_FA EECR_EngineOut_Erratic _TFTKO	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CeEECR_e_EngCoolant TempSnsr6 The calculated high and low limits for the next reading use the following calibrations: Temperature Sensor 1: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 2: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 3: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 4: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 5: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 6: 1) Sensor time constant	 7.6 seconds -60.0 °C 200.0 °C 3.3 seconds -60.0 °C 200.0 °C 4.3 seconds -60.0 °C 200.0 °C 5.7 seconds -60.0 °C 200.0 °C 4.5 seconds -60.0 °C 200.0 °C 4.7 seconds				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			2) Sensor low limit 3) Sensor high limit Temperature Sensor 7: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit *****Generic Example***** If the last temp reading was 90 °C, the Time constant was calibrated at 10 seconds, the low limit was calibrated to -80 °C and the high limit was calibrated to 200 °C the calculated limits are 101 °C and 73 °C. The next reading (after the 90 °C reading) must be between 73 °C and 101 °C to be valid. **********	-60.0 °C 200.0 °C 7.3 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Throttle Position Sensor Performance (single turbo)	P0121	Detects a performance failure in the Throttle Position sensor (TPS) sensor, such as when a TPS value is stuck in range. This diagnostic is performed using the Intake Flow Rationality Diagnostic (IFRD). IFRD calculates modeled values of sensors from other sensors. The other sensors are the Manifold Pressure (MAP) sensor, Turbocharger Boost Pressure sensor and Mass Air Flow (MAF) sensor. These modeled values are compared against the actual sensor values to see if they are similar. If they are similar, then the model passes. If they are not similar, then that model is considered to be failed. Certain combinations of model passes and model failures can be interpreted to be caused by a performance issue with the TPS sensor. In this case, the TPS	See table **P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when ABS(Measured Flow - Modeled Air Flow) Filtered MAPI model fails when ABS(Measured MAP - MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP - MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP - MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP - TIAP Model 1) Filtered TPS model fails when Filtered Throttle Model Error TIAP Correlation model fails when High Engine Air Flow is TRUE AND Measured TIAP -	> 25.2 grams/sec > 20.0 kPa > 25.0 kPa > 25.0 kPa > 30.5 kPa > 250 kPa*(g/s)	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria (Coolant Temp OR OBD Max Coolant Achieved Intake Air Temp Intake Air Temp Powertrain Relay Voltage for a period of time Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables.	>= 400 RPM <= 5,700 RPM >= -9 Deg C = TRUE) <= 130 Deg C = FALSE) -20 Deg C <= 100 Deg C >= 9.1 Volts >= 0.2 Seconds >= 0.50 Modeled Air Flow Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM and MAF Est** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAPI Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Performance diagnostic will fail.	measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is TRUE when Mass Air Flow AND	> 30.0 kPa > 30.0 kPa > 1.0 seconds > 1.0 seconds > a threshold in gm sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow**	No Active DTCs: No Pending DTCs:	**P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA MAF_SensorCircuitFA CrankSensor_FA IAT_SensorFA EECR_EngineArbitrated_FA EECR_EngineOutlet_CktFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault IAT_SensorCircuitFP MnfdTempSensorCktFP		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Manifold Pressure	> a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**	Diagnostic is Enabled			
			AND Filtered Mass Air Flow - Mass Air Flow	< 1.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP**				
			AND Mass Air Flow - Filtered Mass Air Flow	< 3.0 gm/sec				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
TPS1 Circuit Low	P0122	Detects a continuous or intermittent short low or open in TPS1 circuit by monitoring the TPS 1 sensor percent Vref and failing the diagnostic when the TPS percent Vref is too low. This diagnostic only runs when battery voltage is high enough.	TPS1 % Vref < (100% corresponds to 5.0 Volt)	6.50 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P06A3	79/159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
TPS1 Circuit High	P0123	Detects a continuous or intermittent short high in TPS1 circuit by monitoring the TPS 1 sensor percent Vref and failing the diagnostic when the TPS percent Vref is too high. This diagnostic only runs when battery voltage is high enough.	TPS1 % Vref > (100% corresponds to 5.0 Volt)	95.00 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P06A3	79/159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Below Stat Regulating Temperature	P0128	This DTC detects if the ECT (EngineCoolant temperature) does not achieve the required target temperature after an allowed energy accumulation by the engine. This can be caused by an ECT sensor biased low or a cooling system that is not warming up correctly because of a stuck open thermostat or other fault.	Energy is accumulated after the first conbustion event using Range 1, 2 or 3: If the maxium energy is greater than as shown in the supporting tables prior to the Engine outlet coolant achieving the target a fault will be indicated. **Range 1 (Primary):** Ambient air temperature is between 10.0 and 52.0 °C Engine Outlet Coolant reaches the start to open temperature of the flow control device to the radiator (ie: thermostat) minus 11.1 °C. The target temperature for this range will not drop below 66.9 °C **Range 2 (Secondary):** Ambient air temperature is between -9.0 and 10.0 °C Engine Outlet Coolant reaches the start to open temperature of the flow control device to the radiator (ie: thermostat) minus 25.0 °C. The target temperature for this range will not drop below 55.0 °	**P0128 Maximum Acculated Energy - Primary** **P0128 Maximum Acculated Energy - Secondary**	Diagnostic is Enabled No DTCs Engine soak time Engine run time Engine Outlet Coolant Temperature - Range 1: - Range 2: - Range 3: Devices in main cooling circuit are not in in device control If Engine RPM is continuously greater than for this time period Distance traveled	THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA THMR_SWP_Flow8tuckOn_FA THMR_SWP_NoFlow_FA OAT_PtEstFiltFA VehicleSpeedSensor_FA EngineTorqueEstlnaccurate MAF_SensorFA ETHR_CoolantEnergyModel ETHR_RemedialActionLeveil ETHR_RemedialActionLevel2 ETHR_RemedialActionLevel3 EECR_EngineOutlet_FA > 1,800.0 seconds 20.0 - 1,800.0 seconds <47.5 °C <35.6 °C <35.6 °C 9,999 rpm 5.0 seconds >0.8 km	1 failure to set DTC 1 sec/ sample Once per ignition key cycle	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			C **Range 3 (Tertiary):** Ambient air temperature is between -9.0 and -9.0 ° C Engine Outlet Coolant reaches the start to open temperature of the flow control device to the radiator (ie: thermostat) minus 25.0 °C. The target temperature for this range will not drop below 55.0 ° C	**P0128 Maximum Acculated Energy - Tertiary** This diagnostic models the net energy into and out of the cooling system during the warm-up process. The ten energy terms are: heat from combustion (with AFM correction), heat from after-run, heat loss to transmission oil, heat loss to enviroment, heat loss to cabin, heat loss to DFCO, heat loss to engine oil, heat loss to exhaust, and eat loss to autostop.	The diagnostic will abort if the temperature has dropped by after the customer has commanded the engine off Cumulative coolant flow	>5.0 °C >0.00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Circuit Low Voltage Bank 1 Sensor 1 (For use with WRAF - Gen5 ECM	P0131	This DTC determines if the WRAF 02 sensor signal circuit is shorted low. This DTC will detect a short to ground fault to the Pump Current, Reference Cell Voltage, Reference Ground and Trim circuits. When enabled, the diagnostic monitors the three different failure counters it receives from the WRAF Application-Specific Integrated Circuit (ASIC). The individual diagnostic failure counters are incremented based on the message received from the ASIC. The DTC is set based on any of the three individual fail and sample counters.	B1S1 WRAF ASIC indicates a ground short to any of the following WRAF signals: A) Pump Current - short to ground fail counts are accumulated to determine fault status. B) Reference Ground - short to ground fail counts are accumulated to determine fault status. <u>Note:</u> This ASIC is referred to as CJ138 (next Gen version of CJ136 from Bosch).	The ASIC provides a fault indication when the pump current or reference ground fails the following criteria; |Nernst signal - 0.45| >1.0 volts OR |Voltage drop over Rgnd - (internal current source *Rgnd)| >0.5 volts OR CJ138 H/W detection Note: the faults must exist for previous 10 milli - seconds to qualify for a fail flag. The four fault signals have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set.	Diagnostic is Enabled B1S1 DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	P0135, P0030, P0031 or P0032 = Valid = Ready = True = Complete > 20.0 seconds	Signal A: 20 failures out of 24 samples OR Signal B: 20 failures out of 24 samples Continuous in 25 milli - second loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Circuit High Voltage Bank 1 Sensor 1 (For use with WRAF - Gen5 ECM	P0132	This DTC determines if the WRAF 02 sensor signal circuit is shorted high. This DTC will detect a short to power fault to the Pump Current, Reference Cell Voltage, Reference Ground and Trim circuit. When enabled, the diagnostic monitors the three different failure counters it receives from the WRAF Application-Specific Integrated Circuit (ASIC). The individual diagnostic failure counters are incremented based on the message received from the ASIC. The DTC is set based on any of the three individual fail and sample counters.	B1S1 WRAF ASIC indicates a short to power on any of the following WRAF signals: A) Pump Current - short to power fail counts are accumulated to determine fault status. B) Reference Ground - short to power fail counts are accumulated to determine fault status. <u>Note:</u> This ASIC is referred to as CJ138 (next Gen of CJ136 from Bosch).	The ASIC provides a fault indication when the pump current or reference ground fail the following criteria; CJ138 H/W detection Note: the faults must exist for more than 10 msec to qualify for a fail flag. The four fault signals have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set.	Diagnostic is Enabled B1S1 DTC's Not active this key cycle Measure Valid Status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	 P0135, P0030, P0031 or P0032 = Valid = Ready = True = Complete > 20.0 seconds	Signal A: 20 failures out of 24 samples OR Signal B: 20 failures out of 24 samples Frequency: Continuous in 25 milli - second loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Heater Performance Bank 1 Sensor 1	P0135	This DTC determines if the 02 sensor heater is functioning properly by monitoring the current through the heater circuit. This test compares the measured heater current (monitored thru the low side driver) and compares it to the expected values (over the voltage range provided) for the released sensor. The diagnostic failure counter is incremented if the heater current is outside the expected range. This DTC is set based on the fail and sample counters.	Heater Current outside of the expected range of	0.3 < Amps < 4.0	Diagnostic is Enabled No Active DTC's System Voltage Heater Warm-up delay O2S Heater device control B1S1 O2S Heater Duty Cycle All of the above met for	 ECT_Sensor_FA >10.5 Volts = Complete = Not active > zero >120 seconds	/failures out of 9 samples Frequency: 2 tests per trip 10 seconds delay between tests and 1 second execution rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Circuit Low Voltage Bank 1 Sensor 2) (For Single Bank Exhaust Only	P0137	This DTC determines if the 02 sensor signal circuit is shorted low. When enabled, the diagnostic monitors the 02S signal and compares it to the threshold. The diagnostic failure counter is incremented if the 02S signal is below the threshold value. This DTC is set based on the fail and sample counters.	Oxygen Sensor Signal	< 40mvolts	Diagnostic is Enabled No Active DTC's AIR intrusive test Fuel intrusive test Idle intrusive test EGR intrusive test System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Only when FuelLevelDataFault Commanded Equivalence Ratio Air Per Cylinder Fuel Control State Closed Loop Active	 TPS_ThrottleAuthorityDefaulted MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA = Not active = Not active = Not active = Not active 10.5 < Volts = Not active = Not active = Not active = Not active = False = False 0.991 < ratio <1.040 150 < mgrams <800 = Closed Loop = TRUE (Please see **"Closed Loop Enable**	320 failures out of 400 samples Frequency: Continuous in 100 milli-second loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						Clarification" in Supporting Tables).		
					All Fuel Injectors for active Cylinders	Enabled (On)		
					Fuel Condition	Ethanol < 87 %		
					Ethanol Estimation in Progress	= Not Active (Please see **"Ethanol Estimation in Progress"** in Supporting Tables).		
					Fuel State	DFCO not active		
					All of the above met for	> 5.0 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Circuit High Voltage Bank 1 Sensor 2) (For Single Bank Exhaust Only	P0138	This DTC determines if the 02 sensor signal circuit is shorted high or open. When enabled, the diagnostic monitors the 02S signal and compares it to the threshold. The diagnostic failure counter is incremented if the 02S signal is above the threshold value. This DTC is set based on the fail and sample counters.	Oxygen Sensor Signal	> 1,050 mvolts	Diagnostic is Enabled No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Low Fuel Condition Only when FuelLevelDataFault ********** Secondary delay after above conditions are complete (cold start condition) Secondary delay after above conditions are complete (not cold start condition) Commanded Equivalence Ratio ********** All of the above met for	TPS_ThrottleAuthorityDefaulted MAF_SensorFA MAP_SensorFA EvapExcessPurgePsbl_FA FuelInjectorCircuit_FA Ethanol Composition Sensor FA AIR System FA 10.5 < Volts = All Cylinders active = Complete > 5.0 seconds > 30.0 seconds = False = False ********** > 140.0 seconds when engine soak time > 28,800 seconds > 140.0 seconds when engine soak time < 28,800 seconds <1.040 EQR ********** > 3.0 seconds	100 failures out of 125 samples Frequency: Continuous in 100 milli-second loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Slow Response Rich to Lean Bank 1 Sensor 2	P013A	The P013A diagnostic is the third in a sequence of six intrusive secondary 02 monitors which include DTCs P2270, P013E, P013A, P2271, P013F, &P013B. ThisDTC determines if the secondary 02 sensor has an slow response to an A/F change from Rich to Lean and thereby can no longer be used for secondary 02 sensor fuel control or for catalyst monitoring. This diagnostic commands fuel cut off while monitoring the sensor signal and the accumulated mass air flow. Note: The Primary method is used when the secondary 02 sensor signal transitions from above the upper threshold to below the lower threshold, otherwise the Secondary method is used. <u>Primary method:</u> The P013A diagnostic measures the secondary 02 sensor voltage response rate	Primary Method: The EWMA of the Post 02 sensor normalized integral value. The EWMA repass limit is The EWMA calculation uses a 0.28 coefficient. OR Secondary Method: The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.0 units < 7.2 units > 20.0 grams (upper voltage threshold is 450 mvolts and lower voltage threshold is 150 mvolts)	Diagnostic is Enabled No Active DTCs B1S2 DTCs Not Active this key cycle System Voltage Learned heater resistance Green O2S Condition	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemBl TFTK 0 FuelTrimSystemB2 TFTK 0 EngineMisfireDetected_FA Ethanol Composition Sensor FA O2S_Bank_ 1_TFTKO O2S_Bank_ 2_TFTKO P013B, P013E, P013F, P2270 or P2271 >10.5 Volts = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTCs") = Not Valid, Green O2S condition is considered valid until the accumulated air flow is greater than **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations: B1S2, B2S2 (if applicable)	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		between an upper and lower voltage threshold. The response rate is then normalized to mass air flow rate and scaled resulting in a normalized intregral value. The normalized integral is fed into a 1st order lag filter to update the final EWMA result. DTCP013Ais set when the EWMA value exceeds the EWMA threshold. Note: This EWMA diagnostic employs two features, Fast Initial Response (FIR) and Rapid Step Response (RSR). The FIR feature is used following a code clear event or any event that results in erasure of the engine controller's non-volatile memory. The RSR feature is used when a step change in the test result is identified. Both these temporary features improve the EWMA result following a non-typical event by allowing multiple intrusive tests on a given trip until the total number of tests reach a calibration value. Secondary method:			Low Fuel Condition Only when FuelLevelDataFault Post fuel cell Crankshaft Torque DTC's Passed ========== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	in Supporting Tables tab. Airflow accumulation is only enabled when airflow is above 22.0 grams/sec. = False = False = Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info. < 100.0Nm P2270 (and P2272 if applicable) P013E (and P014A if applicable) ==========		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		This fault is set if the secondary 02 sensor does not achieve the required lower voltage threshold before the accumulated mass air flow threshold is reached.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Slow Response Lean to Rich Bank 1 Sensor 2	P013B	The P013B diagnostic is the sixth in a sequence of six intrusive secondary 02 monitors which include DTCs P2270, P013E, P013A, P2271, P013F, &P013B. ThisDTC determines if the secondary 02 sensor has an slow response to an A/F change from Lean to Rich and thereby can no longer be used for secondary 02 sensor fuel control or for catalyst monitoring. This diagnostic increases the delivered fuel while monitoring the sensor signal and the accumulated mass air flow. Note: The Primary method is used when the secondary 02 sensor signal transitions from below the lower threshold to above the upper threshold, otherwise the Secondary method is used. <u>Primary method:</u> The P013B diagnostic measures the secondary 02 sensor voltage response rate	Primary Method: The EWMA of the Post 02 sensor normalized integral value. The EWMA repass limit is The EWMA calculation uses a 0.28 coefficient. OR Secondary Method: The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.0 units < 7.2 units >50 grams (lower voltage threshold is 350 mvolts and upper voltage threshold is 600 mvolts)	Diagnostic is Enabled No Active DTCs B1S2 DTCs Not Active this key cycle System Voltage Learned heater resistance Green O2S Condition	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemBl TFTK 0 FuelTrimSystemB2 TFTK 0 EngineMisfireDetected_FA Ethanol Composition Sensor FA O2S_Bank_ 1_TFTKO O2S_Bank_ 2_TFTKO P013A, P013E, P013F, P2270 or P2271 >10.5 Volts = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTCs") = Not Valid, Green O2S condition is considered valid until the accumulated air flow is greater than **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations:	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		between an lower and upper voltage threshold. The response rate is then normalized to mass air flow rate and scaled resulting in a normalized intregral value. The normalized integral is fed into a 1st order lag filter to update the final EWMA result. DTCP013Bis set when the EWMA value exceeds the EWMA threshold. Note: This EWMA diagnostic employs two features, Fast Initial Response (FIR) and Rapid Step Response (RSR). The FIR feature is used following a code clear event or any event that results in erasure of the engine controller's non-volatile memory. The RSR feature is used when a step change in the test result is identified. Both these temporary features improve the EWMA result following a non-typical event by allowing multiple intrusive tests on a given trip until the total number of tests reach a calibration value. Secondary method:			Green Cat System Condition Low Fuel Condition Only when FuelLevelDataFault Post fuel cell DTC's Passed ========== After above conditions are	B1S2, B2S2 (if applicable) in Supporting Tables tab. Airflow accumulation is only enabled when airflow is above 22.0 grams/sec. = Not Valid, Green Cat System condition is considered valid until accumulated airflow is greater than 360,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C and airflow is greater than 22.0 grams/ sec. (Note: This feature is only enabled when the vehicle is new and cannot be enabled in service). = False = False = Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info. P2270 P013E P013A P2271 P013F ==========		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		This fault is set if the secondary 02 sensor does not achieve the required upper voltage threshold before the accumulated mass air flow threshold is reached.			met: Fuel Enrich mode continued. ========== During this test the following must stay TRUE or the test will abort: 0.960 < Base Commanded EQR < 1.080 ========== During this test: Engine Airflow must stay below: and the delta Engine Airflow over 12.5msec must be :	========== ========== 80 gps < 15.0 gps		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Delayed Response Rich to Lean Bank 1 Sensor 2	P013E	The P013E diagnostic is the second in a sequence of six intrusive secondary 02 monitors which include DTCs P2270, P013E, P013A, P2271, P013F, &P013B. ThisDTC determines if the secondary 02 sensor has an initial delayed response to an A/F change from Rich to Lean and thereby can no longer be used for secondary 02 sensor fuel control or for catalyst monitoring. This diagnostic commands fuel cut off while monitoring the sensor signal and the accumulated mass air flow. This fault is set if the secondary 02 sensor does not achieve the required voltage before the accumulated mass airflow threshold is reached.	Post 02 sensor voltage AND The Accumulated mass airflow monitored during the Delayed Response Test under DFCO DFCO begins after: 1) Catalyst has been rich for a minimum of AND 2) Catalyst Rich Accumulation Air Flow is	> 450 mvolts >50 grams > 1 secs >3.0 grams	Diagnostic is Enabled No Active DTCs B1S2 DTCs Not Active this key cycle System Voltage Learned heater resistance Green 02S Condition	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuellnjectorCircuit_FA FuelTrimSystemBl TFTK 0 FuelTrimSystemB2 TFTK 0 EngineMisfireDetected_FA Ethanol Composition Sensor FA 02S_Bank_ 1_TFTKO 02S_Bank_ 2_TFTKO P013A, P013B, P013F, P2270 or P2271 >10.5 Volts = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTCs") = Not Valid, Green O2S condition is considered valid until the accumulated air flow is greater than **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations:	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						B1S2, B2S2 (if applicable) in Supporting Tables tab. Airflow accumulation is only enabled when airflow is above 22.0 grams/sec.		
					Low Fuel Condition	= False		
					Only when FuelLevelDataFault	= False		
					Post fuel cell	= Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info.		
					Crankshaft Torque	< 100.0Nm		
					DTC's Passed	P2270		
					Number of fueled cylinders	< 3 cylinders		
					========== After above conditions are met: DFCO mode entered (wo driver initiated pedal input).	==========		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Delayed Response Lean to Rich Bank 1 Sensor 2	P013F	The P013F diagnostic is the fifth in a sequence of six intrusive secondary 02 monitors which include DTCs P2270, P013E, P013A, P2271, P013F, &P013B. ThisDTC determines if the secondary 02 sensor has an initial delayed response to an A/F change from Lean to Rich and thereby can no longer be used for secondary 02 sensor fuel control or for catalyst monitoring. This diagnostic increases the delivered fuel while monitoring the sensor signal and the accumulated mass air flow. This fault is set if the secondary 02 sensor does not achieve the required voltage before the accumulated mass airflow threshold is reached.	Post 02 sensor voltage AND The Accumulated mass airflow monitored during the Delayed Response Test	< 350 mvolts >220 grams	Diagnostic is Enabled No Active DTCs B1S2 DTCs Not Active this key cycle System Voltage Learned heater resistance Green 02S Condition	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemBl TFTK0 FuelTrimSystemB2 TFTK0 EngineMisfireDetected_FA Ethanol Composition Sensor FA 02S_Bank_ 1_TFTK0 02S_Bank_ 2_TFTK0 P013A, P013B, P013E, P2270 or P2271 >10.5 Volts = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTCs") = Not Valid, Green 02S condition is considered valid until the accumulated air flow is greater than **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations:	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						B1S2, B2S2 (if applicable) in Supporting Tables tab. Airflow accumulation is only enabled when airflow is above 22.0 grams/sec.		
					Green Cat System Condition	= Not Valid, Green Cat System condition is considered valid until accumulated airflow is greater than 360,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C and airflow is greater than 22.0 grams/ sec. (Note: This feature is only enabled when the vehicle is new and cannot be enabled in service).		
					Low Fuel Condition	= False		
					Only when FuelLevelDataFault	= False		
					Post fuel cell	= Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info.		
					DTC's Passed	P2270 P013E P013A P2271		
					Number of fueled cylinders	> 1 cylinders		
					==========	==========		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					After above conditions are met: Fuel Enrich mode entered. ========== During this test the following must stay TRUE or the test will abort: 0.960 < Base Commanded EQR < 1.080 ========== During this test: Engine Airflow must stay below: and the delta Engine Airflow over 12.5msec must be :	========== ========== 80 gps < 15.0 gps		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
O2S Heater Performance Bank 1 Sensor 2) (For Single Bank Exhaust Only	P0141	This DTC determines if the 02 sensor heater is functioning properly by monitoring the current through the heater circuit. This test compares the measured heater current (monitored thru the low side driver) and compares it to the expected values (over the voltage range provided) for the released sensor. The diagnostic failure counter is incremented if the heater current is outside the expected range. This DTC is set based on the fail and sample counters.	Heater Current outside of the expected range of	0.3 > amps > 2.5	Diagnostic is Enabled No Active DTC's System Voltage Heater Warm-up delay 02S Heater device control B1S1 02S Heater Duty Cycle All of the above met for	ECT_Sensor_FA >10.5 Volts = Complete = Not active > zero > 120 seconds	/failures out of 9 samples Frequency: 2 tests per trip 10 seconds delay between tests and 1 second execution rate.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Delayed Response Rich to Lean Bank 1 Sensor 1) (For use with WRAF	P015A	DTC P015A detects that the primary WRAF oxygen sensor for Bank 1 has delayed response when the air fuel ratio transitions from rich to lean condition. This diagnostic runs simultaneously with the intrusive secondary 02 monitor rich to lean tests (P013E / P013A/ P2271), which commands fuel cut off. Note: The Primary method is used when the primary WRAF 02 sensor signal transitions from above to below the 02 measured EQR threshold, otherwise the Secondary method is used. <u>Primary method:</u> The P015A diagnostic measures the primary WRAF 02 sensor response time between a rich condition above a starting measured EQR threshold and a lower measured EQR threshold. The response time is then scaled and normalized to mass air flow rate, engine speed, Baro,	Primary method: The EWMA of the Pre 02 sensor normalized R2L time delay value. The EWMA repass limit is The EWMA calculation uses a 0.25 coefficient. This method calculates the result when the WRAF 02 sensor measured EQR is OR Secondary Method: The Accumulated time monitored during the R2L Delayed Response Test. AND Pre WRAF 02 sensor measured EQR is	> 0.63 EWMA (sec) < 0.58 EWMA (sec) < 0.800 EQR > 3.5 Seconds > 0.300 EQR	Diagnostic is Enabled No Active DTC's System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition	TPS_ThrottleAuthorityDefaulted MAP_SensorFA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA FuelTrimSystemBI _TFTK0 FuelTrimSystemB2 TFTK0 EthanolCompositionSensor_FA EngineMisfireDetected_FA WRAF_Bank_1_FA P0131, P0132, P013A, P013B, P013E, P013F, P2270, P2271 >10.5 Volts = Not active = Not active = Not active = Not active = False	Frequency: Once per trip Note: if NaESPD_b_FastInitRespIsActive = TRUE for the given Fuel Bank OR NaESPD_b_RapidResponseIsActive = TRUE, multiple tests per trip are allowed	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		and intake air temperature resulting in a normalized delay value. The normalized delay is fed into a 1st order lag filter to update the final EWMA result. DTC P015A is set when the EWMA value exceeds the EWMA threshold. Note: This EWMA diagnostic employs two features, Fast Initial Response (FIR) and Rapid Step Response (RSR). The FIR feature is used following a code clear event or any event that results in erasure of the engine controller's non-volatile memory. The RSR feature is used when a step change in the test result is identified. Both these temporary features improve the EWMA result following a non-typical event by allowing multiple intrusive tests on a given trip until the total number of tests reach a calibration value. <u>Secondary method:</u> This fault is set if the primary WRAF 02 sensor does not achieve the required lower measured EQR			Only when FuelLevelDataFault Green 02S Condition 02 Heater (pre sensor) on for Engine Coolant (Or OBD Coolant Enable Criteria IAT Engine run Accum Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled) Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled) Closed loop integral Closed Looo Active	= False = Not Valid, Green 02S condition is considered valid until the accumulated air flow is greater than **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations: B1S1, B2S1 (if applicable) in Supporting Tables tab. Airflow accumulation is only enabled when airflow is above 22.0 grams/sec. > 30 seconds > 60 °C =TRUE) > -40 °C > 30 seconds 950 < RPM < 3,000 900 < RPM < 3,100 2.0 < gps < 12.5 32.9 < MPH < 80.8 31.1 < MPH < 82.0 0.80 < C/L Int < 1.08 = TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		threshold before a delay time threshold is reached.				(Please see **"Closed Loop Enable Clarification"** in Supporting Tables), not in control of purge		
					Evap	= Not Active		
					Ethanol Estimation in Progress	(Please see **"Ethanol Estimation in Progress"** in Supporting Tables).		
					Baro	> 70kpa		
					Post fuel cell	= enabled		
					EGR Intrusive diagnostic	= not active		
					All post sensor heater delays	= not active		
					O2S Heater (post sensor) on Time	> 60.0 sec		
					Predicted Catalyst temp	475 < °C < 850		
					Fuel State	= DFCO possible		
					==========	==========		
					All of the above met for at least 1.0 seconds, and then the Force Cat Rich intrusive stage is requested.			
					==========	==========		
					Pre O2S EQRB1S1 at end of Cat Rich stage	> 1.070EQR		
					Fuel State	= DFCO active		
					Number of fueled cylinders	< 3 cylinders		
					==========	==========		
					After above conditions are met: DFCO Mode is entered (wo driver initiated Dedal incut).			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Delayed Response Lean to Rich Bank 1 Sensor 1) (For use with WRAF	P015B	DTC P015B detects that the primary WRAF oxygen sensor for Bank 1 has delayed response when the air fuel ratio transitions from lean to rich condition. This diagnostic runs simultaneously with the intrusive secondary 02 monitor lean to rich tests (P013F / P013B), which commands fuel enrichment. Note: The Primary method is used when the primary WRAF 02 sensor signal transitions from lean condition to above the 02 measured EQR threshold, otherwise the Secondary method is used. <u>Primary method:</u> The P015B diagnostic measures the primary WRAF 02 sensor response time between a lean condition and a higher measured EQR threshold. The response time is then scaled and normalized to mass air flow rate, engine speed, Baro, and intake air temperature resulting in	Primary method: The EWMA of the Pre 02 sensor normalized L2R time delay value. The EWMA repass limit is The EWMA calculation uses a 0.25 coefficient. OR Secondary method: The Accumulated time monitored during the L2R Delayed Response Test. AND Pre WRAF 02 sensor measured EQR is OR At end of Cat Rich stage the Pre WRAF 02 sensor measured EQR is	> 0.61 EWMA (sec) < 0.58 EWMA (sec) > 4.0 Seconds < 0.996 EQR < 1.070 EQR	Diagnostic is Enabled No Active DTC's P015Atest is complete and System Voltage EGR Device Control Idle Device Control Fuel Device Control	TPS_ThrottleAuthorityDefaulted MAP_SensorFA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA FuelTrimSystemBI _TFTK0 FuelTrimSystemB2 TFTK0 EthanolCompositionSensor_FA EngineMisfireDetected_FA WRAF_Bank_1_FA P0131, P0132, P013A, P013B, P013E, P013F, P015A, P2270, P2271 = Passed >10.5 Volts = Not active = Not active = Not active	Frequency: Once per trip Note: if NaESPD_b_FastInitResplsActive = TRUE for the given Fuel Bank OR NaESPD_b_RapidResponseIsActive = TRUE, multiple tests per trip are allowed	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		a normalized delay value. The normalized delay is fed into a 1st order lag filter to update the final EWMA result. DTC P015B is set when the EWMA value exceeds the EWMA threshold. Note: This EWMA diagnostic employs two features, Fast Initial Response (FIR) and Rapid Step Response (RSR). The FIR feature is used following a code clear event or any event that results in erasure of the engine controller's non-volatile memory. The RSR feature is used when a step change in the test result is identified. Both these temporary features improve the EWMA result following a non-typical event by allowing multiple intrusive tests on a given trip until the total number of tests reach a calibration value. <u>Secondary method:</u> This fault is set if the primary WRAF 02 sensor does not achieve the required higher measured EQR threshold before a delavtime threshold is			AIR Device Control Low Fuel Condition Only when FuelLevelDataFault Green 02S Condition 02 Heater (pre sensor) on for Engine Coolant (Or OBD Coolant Enable Criteria IAT Engine run Accum Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled) Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keeo test enabled (after	= Not active = False = False = Not Valid, Green 02S condition is considered valid until the accumulated air flow is greater than **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations: B1S1, B2S1 (if applicable) in Supporting Tables tab. Airflow accumulation is only enabled when airflow is above 22.0 grams/sec. > 30 seconds > 60 °C =TRUE) > -40 °C > 30 seconds 950 < RPM < 3,000 900 < RPM < 3,100 2.0 < gps < 12.5 32.9 < MPH < 80.8		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		reached.			initially enabled)	31.1 < MPH < 82.0		
					Closed loop integral	0.80 < C/L Int < 1.08		
					Closed Loop Active	= TRUE (Please see **"Closed Loop Enable Clarification"** in Supporting Tables).		
					Evap	not in control of purge		
					Ethanol Estimation in Progress	= Not Active (Please see **"Ethanol Estimation in Progress"** in Supporting Tables).		
					Baro	> 70kpa		
					Post fuel cell	= enabled		
					EGR Intrusive diagnostic	= not active		
					All post sensor heater delays	= not active		
					O2S Heater (post sensor) on time	> 60.0 sec		
					Predicted Catalyst temp	475 < °C < 850		
					Fuel State	= DFCO inhibit		
					Number of fueled cylinders	> 1 cylinders		
					==========	==========		
					When above conditions are met: Fuel Enrich mode is entered.			
					==========	==========		
					During this test: Engine Airflow must stay between: and the delta Engine Airflow over 12.5msec	0 < gps < 30		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					must be :	< 30.0 gps		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel System Too Lean Bank 1	P0171	Determines if the primary fuel control system for Bank 1 is in a lean condition, based on the filtered long-term purge-on, long term purge-off and short-term fuel trim. A normally operating system operates centered around long-term fuel trim metric of 1.0. For lean conditions extra fuel trim is required therefore values > 1.0 indicates a Lean condition. A fault is determined, when the long term fuel metric exceeds the threshold value. In addition to the long-term fuel trim limit, the short-term fuel trim metric can be monitored and the fault sets once both threshold values are exceeded. The short-term fuel trim metric is only monitored on programs that have acceptable emissions when the long-term fuel metric reaches its full authority.	The filtered, adjusted for purge flow, long-term fuel trim metric, OR the filtered, non-adjusted purge-on long-term fuel trim metric AND The filtered short-term fuel trim metric (Note: any value below 0.95 effectively nullifies the short-term fuel trim criteria) If a fault has been detected the filtered, adjusted for purge flow, long-term fuel trim metric, AND the filtered, non-adjusted purge on long-term fuel trim metric AND The filtered short-term fuel trim metric to repass the diagnostic.	>= 1.350 >= 1.350 >= 0.100 < 1.250 < 1.250 < 2.000	The primary fuel trim diagnostic is enabled Engine speed BARO Coolant Temp Coolant Temp MAP Inlet Air Temp MAF Fuel Level Long Term Fuel Trim data accumulation: Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control and/or diagnosis	400 <rpm< 5,700 > 70 kPa > -20 °C (or OBD Coolant Enable Criteria = TRUE) < 135 °C 16 <kPa< 256 -20 <°C< 150 1 <g/s< 1,000 > 10% or if fuel sender is faulty the diagnostic will bypass the fuel level criteria. > 27.50 seconds of data must accumulate on each trip, with at least 15.00 seconds of data in the current fuel trim cell before a pass or fail decision can be made. Additional time can be required for cold ambient starts to accommodate larger minimum LTM's for startability reasons. See **Startup Engine Coolant adjusment to Minimum accumulation time** . (Please see **P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage** in Supporting Tables for a list of cells utilized for diagnosis)	Frequency: 100 ms Continuous Loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Closed Loop Long Term FT	Enabled Enabled (Please see **"Closed Loop Enable Clarification"** and **"Long Term FT Enable CriteriaPrimary Long Term Fuel Trim Enable Criteria"** in Supporting Tables.)		
					EGR Diag. Catalyst Diag. Post 02 Diag. Device Control EVAP Diag. ---------- Delay during GPF Regeneration Standard startup delays are re-initialized following completion of GPF Regen to allow system stabilization. (See "Long Term Fuel Trim data accumulation" above.) ---------- No active DTC:	Intrusive Test Not Active Intrusive Test Not Active Intrusive Test Not Active Not Active Large Leak Diagnostic (P0455) Not Active ---------- No Delay ---------- 1AC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR System FA EvapExcessPurgePsbl_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						Ethanol Composition Sensor FA FuelInjectorCircuit_FA EngineMisfireDetected_FA EGRValvePerformance_FA EGRValveCircuit.FA MAP_EngineVacuumStatus AmbPresDfltdStatus TC_BoostPresSnsrFA O2S_Bank_1_Sensor_1_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel System Too Rich Bank 1	P0172	Determines if the fuel control system is in a rich condition, based on the filtered long-term fuel trim metric.A normally operating system operates centered around long-term fuel trim metric of 1.0. For rich conditions less fuel trim is required therefor values < 1.0 indicate a rich condition. There are two methods to determine a Rich fault. They are Passive and Intrusive. A Passive Test decision can be made up until the time that purge is first enabled. From that point forward, rich faults can only be detected by turning purge off intrusively. If during this period of time the filtered long-term fuel trim metric exceeds the threshold a fault will be set. In addition to the long-term fuel trim limit, the short-term fuel trim metric can be monitored and the fault sets once both threshold values are exceeded. The short-	**Passive Test:** The filtered Non-Purge Long Term Fuel Trim metric	<= 0.713		Secondary Parameters and Enable Conditions are identical to those for P0171, with the exception that fuel level is not considered.	Frequency: 100 ms Continuous Loop	Type B, 2 Trips
			AND					
			The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria)	<= 2.000				
			*****************************	**************************	******************************	******************************	*******************	
			Intrusive Test: For 2 out of 3 intrusive segments		Purge Vapor Fuel	<= 22.00% Intrusive Test is inhibited when Purge Vapor percentage is greater than this threshold. (Note: values greater than 50% indicate the Purge Vapor Fuel requirement is not being used) A minimum number of accumlated Fuel Trim Data samples are required to adequately learn a correct Purge Vapor Fuel value. See the table **Minimum Non-Purge Samples for Purge (Vapor Fuel)** for the Purge Off cells used to validate the Purge Vapor Fuel parameter.	**Segment Definition:** Segments can last up to 60 seconds and are separated by the lesser of 20.00 seconds of purge-on time or enough time to purge 36 grams of vapor. A maximum of 3 completed segments or 20 attempts are allowed for each intrusive test. After an intrusive test report is completed, another intrusive test cannot occur for 300 seconds to allow sufficient	
			The filtered Purge Long Term Fuel Trim metric	<= 0.720				
			AND					
			The filtered Non-Purge Long Term Fuel Trim metric	<= 0.713				
			AND					
			The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria)	<= 2.000 If a fault has been detected (by the passive or intrusive test) the long-term fuel trim metric must be > 0.731 and the short-				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		term fuel trim metric is only monitored on programs that have acceptable emissions when the long-term fuel metric reaches its full authority. Once purge is enabled if the filtered Purge Long Term Fuel Trim metric > 0.720 , the test passes without intrusively checking the filtered Non-Purge Long Term Fuel Trim metric. However if the filtered Purge Long Term Fuel Trim metric is <= 0.720 , the Intrusive test is invoked. The purge is ramped off to determine if excess purge vapor is the cause of the rich condition. If during 2 out of 3 intrusive segments, the filtered Purge Long Term Fuel Trim metric <= 0.713 the fault will set. Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions, and the execution frequency of other diagnostics. This is why the intrusive test is operated over several		term fuel trim metric must be > 0.000 to repass the diagnostic. The intrusive test will be enabled at long-term fuel metric values < 0.72 until the diagnostic repasses after a failure.		If the accumulated purge volume is > 1,400.0 grams, the intrusive test will not be inhibited even if Purge Vapor Fuel is > 22.0%.	time to purge excess vapors from the canister. During this period, fuel trim will pass if the filtered Purge Long Term Fuel Trim metric > 0.720 for at least 150.00 seconds, indicating that the canister has been purged.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		segments allowing Purge to renable between segments. Likewise, for these reasons, if after the 3 intrusive segments the diagnostic continues to pass, there is a delay period of 300 seconds to allow sufficient time to purge excess vapors from the canister, before re-evaluating a Rich condition if it still exists.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Temperature Sensor 1 Circuit Low Fault	P0182	This DTC diagnose SENT fuel rail temperature sensor 1 that is too low out of range. If the sensor digital value (repressing the refernce voltage) is below the lower digital threshold, the low fail counter then increments. If the low fail counter reaches its threshold then a fail is reported. A pass is reported for this DTC if the low sample counter reaches its threshold.	Fuel Temperature Sensor 1 SENT digital read value	< 145	Fuel Temperature Out of Range Diagnoistic Enabled No Fault Active on No Fault Pending on	True Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (U0625, U101B, U0670, U0671) SENT Intenal Error Fault Active (P126E) Fuel Temperature Sensor SENT Message Error Fault Active (P128C) SENT Intenal Error Fault Pending (P126E) Fuel Temperature Sensor SENT Message Error Fault Pending (P128C)	50.00 failures out of 62.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Temperature Sensor 1 Circuit High Fault	P0183	This DTC diagnose SENT fuel rail temperature sensor 1 that is too high out of range. If the sensor digital value (repressing the refernce voltage) is above the upper digital threshold, the high fail counter then increments. If the high fail counter reaches its threshold then a fail is reported. A pass is reported for this DTC if the high sample counter reaches its threshold.	Fuel Temperature Sensor 1 SENT digital read value	> 1,865	Fuel Temperature Out of Range Diagnoistic Enabled No Fault Active on No Fault Pending	True Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (U0625, U101B, U0670, U0671) SENT Intenal Error Fault Active (P126E) Fuel Temperature Sensor SENT Message Error Fault Active (P128C) SENT Intenal Error Fault Pending (P126E) Fuel Temperature Sensor SENT Message Error Fault Pending (P128C)	50.00 failures out of 62.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Temperature Sensor 2 Circuit Low Fault	P0187	This DTC diagnose SENT fuel rail temperature sensor 2 that is too low out of range. If the sensor digital value (repressing the refernce voltage) is below the lower digital read threshold, the low fail counter then increments. If the low fail counter reaches its threshold then a fail is reported. A pass is reported for this DTC if the low sample counter reaches its threshold.	Fuel Temperature Sensor 1 SENT digital read value	< 145.00	Fuel Temperature Out of Range Diagnoistic Enabled No Fault Active on No Fault Pending	True Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (U0625, U101B, U0670, U0671) SENT Intenal Error Fault Active (P126F) Fuel Temperature Sensor SENT Message Error Fault Active (P128D) SENT Intenal Error Fault Pending (P126F) Fuel Temperature Sensor SENT Message Error Fault Pending (P128D)	50.00 failures out of 62.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Temperature Sensor 2 Circuit High Fault	P0188	This DTC diagnose SENT fuel rail temperature sensor 2 that is too high out of range. If the sensor digital value (repressing the refernce voltage) is above the upper digital read threshold, the high fail counter then increments. If the high fail counter reaches its threshold then a fail is reported. A pass is reported for this DTC if the high sample counter reaches its threshold.	Fuel Temperature Sensor 1 SENT digital read value	> 1,865.00	Fuel Temperature Out of Range Diagnoistic Enabled No Fault Active on No Fault Pending	True Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (U0625, U101B, U0670, U0671) SENT Intenal Error Fault Active (P126F) Fuel Temperature Sensor SENT Message Error Fault Active (P128D) SENT Intenal Error Fault Pending (P126F) Fuel Temperature Sensor SENT Message Error Fault Pending (P128D)	50.00 failures out of 62.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Sensor "B" Circuit Range/ Performance	P018B	This DTC detects a fuel pressure sensor response stuck within the normal operating range using an intrusive test (as follows) a] Intrusive Test Trigger: 1] Fuel Pump Duty Cycle Clamped Time (min or max duty cycle) >= 5 sec Or 2] Fuel Pres Err Variance <= calibration value KeFDBR_cmp_FPSS_ MinPres Variance ; Otherwise, Report status as Pass b] Intrusive test freq limit: 60 sec between intrusive tests that pass, c] Intrusive test Fuel Flow limit: Fuel Flow Actual < Max allowed Fuel Flow rate	Sensed fuel pressure change [absolute value, during intrusive test]	<30.00 kPa	al Diagnostic is .. b) Timer Engine Running c1) Fuel Flow Rate Valid c2) Fault bundle FDB_FuelPresSnsrCktFA c3) Reference Voltage Fault Status [DTC P0641] c4) Fault bundle FAB_FuelPmpCktFA c5) Fuel Control Enable Fault Active [DTC P12A6] c6) Fuel Pump Driver Module OverTemp Fault Active [DTC P1255] c7) Fuel Pump Speed Fault Active [DTCP129F] c8) CAN Sensor Bus message $0C3 Comm Fault [DTCP165C] c9) CAN Sensor Bus Fuel Pmp Speed Command ARC and Checksum Comm Fault Code [DTC U18A7] c10) Fuel Pump Duty Cycle Fault Active c11) Sensor Configuration [Wired to FTZM?] c12) Sensor Bus Relay On d) Emissions Fuel Level Low [Message $3FB] e) Fuel Control Enable f) Fuel Pump Control State g) Instantaneous Fuel	a) ENABLED b) >= 5.00 seconds c1)== TRUE c2) == False c3) == False c4] == False c5) == False c6) == False c7) == False c8) == False c9] == False c10) == False c11) == CeFDBR_e_WiredTo_FT ZM c12) == TRUE d) == False e) == TRUE f) == Normal Control OR == Fuel Pres Sensor Stuck Control g) >= 0.05 gm/sec	1 sample/ 12.5 millisec Intrusive Test Duration: Fuel Flow - related (5 to 12 sec)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Flow h) Diagnostic System Disabled j1) Fuel Pmp Speed Command Alive Rolling Count and Checksum Error [CAN Bus B $0CE] [DTCU18A7] j2) CAN Sensor Bus message $0C3_Available j3) Fuel Pres Sensor Ref Voltage Status Message Counter Incorrect Alive Rolling Count and Checksum Error [CAN Bus B $0C3][DTC U18A7]	h) == False j1)== False j2) == TRUE j3) == False		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Sensor "B" Circuit Low	P018C	This DTC detects if the fuel pressure sensor circuit is shorted low Values are analyzed as percent of sensor reference voltage [[Abs [5.0V - SensorVoltsActual] / 5.0V] *100%]	Fuel Pressure Sensor output % [re. full range as percent of 5.0V reference]	< 4.00 % or [0 kPa gauge]	a) Diagnostic is .. b) Run_Crank Active c) Diagnostic System Disabled d) Pressure Sensor Configuration	a) ENABLED b) == TRUE c) == False d) If calibration value CeFDBR_e_WiredTo_FTZM == WiredTo ECM Else see Case2	64.00 failures/ 80.00 samples 1 sample/12.5 ms	Type B, 2 Trips
			Fuel Pressure Sensor output % [re. full range as percent of 5.0V reference]	< 4.00 % or [0 kPa gauge]	a) Diagnostic is .. b) Run_Crank Active c) Diagnostic System Disabled d1) Pressure Sensor Configuration d2) Sensor Bus Relay On d3) CAN Sensor Bus message $0C3 Available d4) Fuel Pres Sensor Ref Voltage Status Message Counter Incorrect Alive Rolling Count and Checksum Error [CAN Bus B $0C3] [Info1]	a) ENABLED b) == TRUE c) == False d1) If calibration value CeFDBR_e_WiredTo_FTZM == WiredTo FTZM Else see Case1 d2) == TRUE d3) == TRUE d4) == False	64.00 failures/ 80.00 samples 1 sample/12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pressure Sensor "B" Circuit High	P018D	This DTC detects if the fuel pressure sensor circuit is shorted High Values are analyzed as percent of sensor reference voltage [[Abs [5.0V - SensorVoltsActual] / 5.0V] *100%]	Fuel Pressure Sensor output % [re. full range as percent of 5.0V reference]	> 96.00 % or [743 kPa ga]	a) Diagnostic is .. b) Run_Crank Active c) Diagnostic System Disabled d) Pressure Sensor Configuration	a) ENABLED b) == TRUE c) == False d) If calibration value CeFDBR_e_WiredTo_FTZM == WiredTo ECM Else see Case2	64.00 failures/ 80.00 samples 1 sample/12.5 ms	Type B, 2 Trips
			Fuel Pressure Sensor output % [re. full range as percent of 5.0V reference]	> 96.00 % or [743 kPa ga]	a) Diagnostic is .. b) Run_Crank Active c) Diagnostic System Disabled d1) Pressure Sensor Configuration d2) Sensor Bus Relay On d3) CAN Sensor Bus message $0C3 Available d4) Fuel Pres Sensor Ref Voltage Status Message Counter Incorrect Alive Rolling Count and Checksum Error [CAN Bus B $0C3][Info1]	a) ENABLED b) == TRUE c) == False d1) If calibration value CeFDBR_e_WiredTo_FTZM == WiredTo FTZM Else See Case 1 d2) == TRUE d3) == TRUE d4) == False	64.00 failures/ 80.00 samples 1 sample/12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT SIDI High Pressure Sensor Performance	P0191	The DTC determines if there is a skewed control fuel rail sensor (Sensori) via a comparison to diagnostic sensor (sensor2) continuously when the engine is running and the commanded pressure is steady.	Primary sensor (P1) vs. Secondary sensor (P2) performance rationality ((Low Limit fail Filtered Fuel Control Error) OR (High Limit Fail: Filtered Fuel Control Error)) AND (Filtered Absolute delta between sensori and sensor2	<= **P0191 - Low fail limit of fuel control due to pressure sensor skewed low** (See supporting table) >= **P0191 - High fail limit of fuel control due to high pressure sensor skewed High** (see Supporting table) >= 1.00 mpa Note: fuel control error is calcuated based on the squreroot of senorl divided by sensor2, this value is filter to ensure proper failure detection. Absolute delta between sensori and sensor2 value is filter to ensure proper failure detection.	Commanded Pressure rate of change (increasing or dercresing) fora period of time	<3.00 mpa >= 1.25 seconds Enabled when a code clear is not active or not exiting device control	Filter Fuel Control Error term and Absolute delta between sensori and sensor2 exceed Low or High Fail limit for a duration >= 1.50 seconds This is diagnostic runs Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Pressure Sensor 1 Out of Range	P0192	This DTC diagnose SENT high pressure sensor 1 that is too low out of range. If the sensor digital value (repressing the refernce voltage) is below the lower digital threshold, the low fail counter then increments. If the low fail counter reaches its threshold then a fail is reported. A pass is reported for this DTC if the low sample counter reaches its threshold.	High Pressure Rail Sensor 1 SENT digital read value	=< 66			Time Based: 400 Failuerout of 500 Samples 6.25 ms per Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Temperature (EOT) Circuit Low	P0197	Controller specific output driver circuit diagnoses the Engine Oil Temperature (EOT) Sensor low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Engine Oil Temperature Sensor (EOT) Circuit Resistance	< 25 ohms	Diagnostic Status	Enabled	4 failures out of 5 samples Sampled every 1 second	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Temperature (EOT) Circuit High	P0198	Controller specific output driver circuit diagnoses the Engine Oil Temperature (EOT) Sensor low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Engine Oil Temperature Sensor (EOT) Circuit Resistance	> 450,000 ohms	Diagnostic Status Engine Run Time OR ECT	Enabled > 20.0 seconds >= -20 Deg C	4 failures out of 5 samples Sampled every 1 second	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Temperature Sensor (EOT) Circuit Intermittent	P0199	Determines if an intermittent fault exists on the engine oil temperature sensor circuit. This diagnostic compares each temperature sample to the previous sample and measures cumulative error over a sample period.	**Continuous Test** <u>Pass/Fail Condition:</u> Temperature signal string length, cumulative sum of absolute value of (Oil Temperature - Previous Oil Temperature)	String Length >= 10.00 °C	None	Enabled	4 failures out of 5 samples, sampled every 2 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Temperature Sensor B Circuit Low	P01BB	Controller specific output driver circuit diagnoses the Engine Oil Temperature Sensor B low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Engine Oil Temperature Sensor B Circuit Resistance	< 25 ohms	Diagnostic Status	Enabled	4 failures out of 5 samples Sampled every 1 second	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Temperature Sensor B Circuit High	P01BC	Controller specific output driver circuit diagnoses the Engine Oil Temperature Sensor B low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Engine Oil Temperature Sensor B Circuit Resistance	> 450,000 ohms	Diagnostic Status Engine Run Time OR ECT	Enabled > 20.0 seconds >= -20 Deg C	4 failures out of 5 samples Sampled every 1 second	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Temperature Sensor B Circuit Intermittent	P01BD	Determines if an intermittent fault exists on the engine oil temperature sensor B circuit. This diagnostic compares each temperature sample to the previous sample and measures cumulative error over a sample period.	**Continuous Test** <u>Pass/Fail Condition:</u> Temperature signal string length, cumulative sum of absolute value of (Oil Temperature - Previous Oil Temperature)	String Length >= 10.00 °C	None	Enabled AND EngOilTempFA = FALSE	4 failures out of 5 samples, sampled every 2 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Coolant Temperature Dropped Below Diagnostic Monitoring Temperature (HEAT)	P01F0	This DTC detects an unexplained cooling system cool down below the OBD monitoring threshold during normal operating conditions. This check is run throughout the key cycle.	Engine outlet coolant temperature drops below for an unexpected reason	< 60.90 Deg C	Diagnostic is Enabled No Active DTC's Engine Runtime Distance traveled this key cycle Ambient air pressure Ambient air temperature ********** Engine coolant temperature At least once during the key cycle ********** Heat to coolant DFCO time RPM Active Fuel Management	 ECT_Sensor_Ckt_FA VehicleSpeedSensor_FA OAT_PtEstFiltFA THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA EngineTorqueEstInaccurate ECT_Sensor_Perf_FA THMR_SWP_NoFlow_FA THMR_SWP_Flow8tuckOn_FA >0.0 seconds >0.8 km > 55.0 kPa > -9.0 Deg C > 66.90 Deg C > **P01F0 - Heat To Coolant Min 2D** < 5.0 seconds < 9,999	48 seconds out of a 60 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					is not in Actual flow derivative Engine flow derivative	Half Cylinder Mode <70.00 <80.00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 Open Circuit - (SIDI)	P0201	Controller specific output driver circuit diagnoses Injector 1 low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Or Controller specific output driver circuit diagnoses Injector 1 high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit. Or Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	>= 200 KOhms impedance between signal and controller ground >= 200 KOhms impedance between signal and controller ground	Battery Voltage Engine Run Time	>=11 Volts >= 0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 Open Circuit - (SIDI)	P0202	Controller specific output driver circuit diagnoses Injector 2 low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Or Controller specific output driver circuit diagnoses Injector 2 high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit. Or Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	>= 200 KOhms impedance between signal and controller ground >= 200 KOhms impedance between signal and controller ground	Battery Voltage Engine Run Time	>=11 Volts >= 0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector3 Open Circuit - (SIDI)	P0203	Controller specific output driver circuit diagnoses Injector 3 low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Or Controller specific output driver circuit diagnoses Injector 3 high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit. Or Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	>= 200 KOhms impedance between signal and controller ground >= 200 KOhms impedance between signal and controller ground	Battery Voltage Engine Run Time	>=11 Volts >= 0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 Open Circuit - (SIDI)	P0204	Controller specific output driver circuit diagnoses Injector 4 low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. Or Controller specific output driver circuit diagnoses Injector 4 high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit. Or Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	>= 200 KOhms impedance between signal and controller ground >= 200 KOhms impedance between signal and controller ground	Battery Voltage Engine Run Time	>=11 Volts >= 0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
TPS2 Circuit Low	P0222	Detects a continuous or intermittent short low or open in TPS2 circuit by monitoring the TPS 2 sensor percent Vref and failing the diagnostic when the TPS percent Vref is too low. This diagnostic only runs when battery voltage is high enough.	TPS2 % Vref < (100% corresponds to 5.0 Volt)	5.00 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P06A3	79/159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
TPS2 Circuit High	P0223	Detects a continuous or intermittent short high in TPS2 circuit by monitoring the TPS 2 sensor percent Vref and failing the diagnostic when the TPS percent Vref is too high. This diagnostic only runs when battery voltage is high enough.	TPS2 % Vref > (100% corresponds to 5.0 Volt)	91.80 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P06A3	79/159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger Boost Pressure (TIAP) Sensor Performance (single turbo)	P0236	Detects a performance failure in the Turbocharger Boost Pressure sensor, such as when a Turbocharger Boost Pressure value is stuck in range. This diagnostic is performed using the Intake Flow Rationality Diagnostic (IFRD). IFRD calculates modeled values of sensors from other sensors. The other sensors are the Mass Air Flow (MAF) sensor, Manifold Pressure (MAP) sensor and Throttle Position sensor (TPS). These modeled values are compared against the actual sensor values to see if they are similar. If they are similar, then the model passes. If they are not similar, then that model is considered to be failed. Certain combinations of model passes and model failures can be interpreted to be caused by a performance issue with the Turbocharger Boost	**Engine Running:** See table **P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when ABS(Measured Flow - Modeled Air Flow) Filtered MAPI model fails when ABS(Measured MAP - MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP - MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP - MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP - TIAP Model 1) Filtered TPS model fails when Filtered Throttle Model Error TIAP Correlation model fails when High Engine Air Flow is TRUE AND	> 25.2 grams/sec > 20.0 kPa > 25.0 kPa > 25.0 kPa > 30.5 kPa > 250 kPa*(g/s)	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria (Coolant Temp OR OBD Max Coolant Achieved Intake Air Temp Intake Air Temp Powertrain Relay Voltage for a period of time Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables.	>= 400 RPM <= 5,700 RPM >= -9 Deg C = TRUE) <= 130 Deg C = FALSE) -20 Deg C <= 100 Deg C >= 9.1 Volts >= 0.2 Seconds >= 0.50 Modeled Air Flow Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM and MAF Est** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAPI Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by	Continuous Calculation are performed every 12.5 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Pressure sensor. In this case, the Turbocharger Boost Pressure Performance diagnostic will fail.	Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is TRUE when Mass Air Flow	> 30.0 kPa > 30.0 kPa > 1.0 seconds > 1.0 seconds > a threshold in gm/sec as a function of engine speed See table	No Active DTCs: No Pending DTCs:	**P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA MAF_SensorCircuitFA CrankSensor_FA IAT_SensorFA EECR_EngineArbitrated_FA EECR_EngineOutlet_CktFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault IAT_SensorCircuitFP MnfdTempSensorCktFP		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow	Diagnostic is Enabled			
			AND Manifold Pressure	> a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**				
			AND Filtered Mass Air Flow - Mass Air Flow	< 1.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm/sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP**				
			AND Mass Air Flow - Filtered Mass Air Flow	< 3.0 gm/sec				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharge r Boost Pressure Sensor Circuit Low	P0237	Detects a continuous short to ground in the Turbocharger Boost Pressure signal circuit by monitoring the Turbocharger Boost Pressure sensor output voltage and failing the diagnostic when the Turbocharger Boost Pressure voltage is too low. The Turbocharger Boost Pressure sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	Turbocharger Boost Pressure Voltage	< 14.4% of 5 Volt Range (This is equal to 50.0 kPa)	Diagnostic is Enabled		320 failures out of 400 samples 1 sample every 12.5 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharge r Boost Pressure Sensor Circuit High	P0238	Detects a continuous short to power or open circuit in the Turbocharger Boost Pressure signal circuit by monitoring the Turbocharger Boost Pressure sensor output voltage and failing the diagnostic when the Turbocharger Boost Pressure voltage is too high. The Turbocharger Boost Pressure sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure.	Turbocharger Boost Pressure Voltage	> 78.0% of 5 Volt Range (This is equal to 336.0 kPa)	Diagnostic is Enabled		320 failures out of 400 samples 1 sample every 12.5 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger Wastegate / Supercharger Boost Solenoid A Control Circuit	P0243	Controller specific output driver circuit diagnostic, diagnosing the 'turbocharger boost solenoid'A' actuator' low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In a parallel application, turbocharger 'A' is associated with engine bank 1.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 200 K Q impedance between output and controller ground	Diagnostic enabled ********** Powertrain relay voltage Ignition run crank voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts >5.00 Volts **********	10 failures out of 12 samples 100ms /sample	Type A, 1 Trips Note: In certain controllers P0245 may also set turbocharger wastegate / supercharger boost solenoid A control circuit low

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger Wastegate / Supercharger Boost Solenoid A Control Circuit Low	P0245	Controller specific output driver circuit diagnostic, diagnosing the 'turbocharger boost solenoid 'A' actuator' low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In a parallel application, turbocharger 'A'is associated with engine bank 1.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground. In certain controllers this diagnosis runs only when the HWIO-output is driven by the application S/W.	< 0.5 Q impedance between output and controller ground	Diagnostic enabled ********** Powertrain relay voltage Ignition run crank voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts >5.00 Volts **********	10 failures out of 12 samples 100ms /sample	Type A, 1 Trips Note: In certain controllers P0243 may also set turbocharger wastegate / supercharger boost solenoid A control circuit

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbocharger Wastegate / Supercharger Boost Solenoid A Control Circuit High	P0246	Controller specific output driver circuit diagnostic, diagnosing the 'turbocharger boost solenoid 'A' actuator' low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds. In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In a parallel application, turbocharger 'A'is associated with engine bank 1.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power. In certain controllers this diagnosis runs only when the HWIO-output is driven by the application S/W.	< 0.5 Q impedance between output and controller power	Diagnostic enabled ********** Powertrain relay voltage Ignition run crank voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts >5.00 Volts **********	10 failures out of 12 samples 100ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 Low side circuit shorted to ground (SIDI)	P0261	Controller specific output driver circuit diagnoses Injector 1 low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 Low side circuit shorted to power (SIDI)	P0262	Controller specific output driver circuit diagnoses Injector 1 low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	25 amp >= through low side driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 Low side circuit shorted to ground (SIDI)	P0264	Controller specific output driver circuit diagnoses Injector 2 low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 Low side circuit shorted to power (SIDI)	P0265	Controller specific output driver circuit diagnoses Injector 2 low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	25 amp >= through low side driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector3 Low side circuit shorted to ground (SIDI)	P0267	Controller specific output driver circuit diagnoses Injector 3 low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector3 Low side circuit shorted to power (SIDI)	P0268	Controller specific output driver circuit diagnoses Injector 3 low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	25 amp >= through low side driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Pump Performance	P026E	This DTC indicates a pump flow deviation failure. An expected phase current of the pump is superviced to detect any pump malfunction.	Absolute Pump AC (Phase) current error = (Actual pump speed refer to **PmpPerf: Tabel to estimate the expected pump AC current based on the pump speed,** in Supporting table) - Actual Pump AC current For more than	> 4.00 A > 2.00 sec	Pump H/W present Diagnostic enabled ********** Actual pump speed ********** NelCPD_b_IC_PmpMtrCurrFA OR Pump Current OOR Error ********** Powertrain relay voltage Or WCP direct connected too Batt (Coolant Temp OR OBD Coolant enable Criteria) AND (Coolant Temp OR OBD max Coolant Temp achieved) ********** - Pump enabled - Engine does not crank - Diagnostic system not disabled - No Fault active ICP_CWP_LcFA ICP_CWP_Rsp_FoFA	True True ********** > 1,000 rpm ********** = False ********** >=11.0 Volts False >10.00C =TRUE <= 126.00 C =FALSE **********	16 failures out of 20 samples 1000ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 Low side circuit shorted to ground (SIDI)	P0270	Controller specific output driver circuit diagnoses Injector 4 low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	 <= 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 Low side circuit shorted to power (SIDI)	P0271	Controller specific output driver circuit diagnoses Injector 4 low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	25 amp >= through low side driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbo/Super Charger Engine Underboost Wastegate Position Deviation; Turbocharge r with electronic wastegate.	P0299	This DTC indicates a wastegate position deviation which will lead into an underboost situation.	Wastegate Position deviation Error = (Expected Wastegate Position - Actual Wastegate Position)	< refer to **P0299: WG negative deviation fail threshold over engine speed and desired torque.** + **P0299: Additive offset on WG negative deviation ambient correction,** in Supporting tables.	Dev. Diagnostic enable ********** Coolant temperature or OBD Coolant Enable Criteria and Coolant temperature and not OBD Max Coolant Achived ********** Engine speed ********** Desired Torque ********** Desired Torque derivative in range Actual wastegate position in range Actual wastegate position derivative in range ********** All conditions haveto be fulfilled for:	True ********** > -40.0 °C < 150.0 °C ********** > refer to **P0234 P0299: Engine speed minimum limit over ambient pressure to enable the WG deviation diagnosis,** in Supporting tables. ********** > refer to **P0234 P0299: Desired torque minimum limit overAmbient pressure to enable the WG deviation diagnosis,** in Supporting tables. ********** > -30.00 Nm/sec < 30.00 Nm/sec > 40.00 % < 100.00 % > -15.00 %/sec < 20.00 %/sec ********** > refer to	25 failures out of 30 samples 100ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					********** No active DTCs: ********** No device control active for compresseor recirculation valve.	**P0234 P0299: WG position deviation diagnostic delay function of engine speed and ambient pressure** in Supporting table ********** WGAR_b_WG_CktFA NaWGAR_b_PstnCntrlFA CRAR_b_CRV_CktFA ECT_Sensor_FA IAT_SensorFA BSTR_b_BoostSnsrFA AmbientAirDefault **********		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 1 Injector Circuit Range/ Performance	P02EE	Diagnostic to determine if Cylinder 1 injector voltage feedback measured from the analog to digital converter is rational. The measured voltage is checked when the injection pulse width is large enough ensuring the injector pintle has achieved max travel and the injector voltage flux through the coil has reach the max stabilization limit	Injector voltage feedback is not able to detect an opening magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Injector voltage feedback is not able to detect a closing time OR Measured Voltage feedback converted to Injector closing time OR Measured Voltage	= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Opening Magnitude** (See supporting table) >= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Opening Magnitude** (See supporting table) = **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Closing Time** (See supporting table) >=	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Valid (See Definition in Supporting Material below) Injection Pulse Width	= True >= **P02EE P02EF P02F0 P02F1P30D4- Voltage Feedback Rationalities Minimum Pulse Width**	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			feedback converted to Injector closing time	**P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Closing Time** (See supporting table)				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 2 Injector Circuit Range/ Performance	P02EF	Diagnostic to determine if Cylinder 2 injector voltage feedback measured from the analog to digital converter is rational. The measured voltage is checked when the injection pulse width is large enough ensuring the injector pintle has achieved max travel and the injector voltage flux through the coil has reach the max stabilization limit	Injector voltage feedback is not able to detect an opening magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Injector voltage feedback is not able to detect a closing time OR Measured Voltage feedback converted to Injector closing time OR Measured Voltage	= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Opening Magnitude** (See supporting table) >= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Opening Magnitude** (See supporting table) = **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Closing Time** (See supporting table) >=	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Valid (See Definition in Supporting Material below) Injection Pulse Width	= True >= **P02EE P02EF P02F0 P02F1P30D4- Voltage Feedback Rationalities Minimum Pulse Width**	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			feedback converted to Injector closing time	**P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Closing Time** (See supporting table)				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 3 Injector Circuit Range/ Performance	P02F0	Diagnostic to determine if Cylinder 3 injector voltage feedback measured from the analog to digital converter is rational. The measured voltage is checked when the injection pulse width is large enough ensuring the injector pintle has achieved max travel and the injector voltage flux through the coil has reach the max stabilization limit	Injector voltage feedback is not able to detect an opening magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Injector voltage feedback is not able to detect a closing time OR Measured Voltage feedback converted to Injector closing time OR Measured Voltage	= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Opening Magnitude** (See supporting table) >= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Opening Magnitude** (See supporting table) = **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Closing Time** (See supporting table) >=	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Valid (See Definition in Supporting Material below) Injection Pulse Width	= True >= **P02EE P02EF P02F0 P02F1P30D4- Voltage Feedback Rationalities Minimum Pulse Width**	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			feedback converted to Injector closing time	**P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Closing Time** (See supporting table)				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 4 Injector Circuit Range/ Performance	P02F1	Diagnostic to determine if Cylinder 4 injector voltage feedback measured from the analog to digital converter is rational. The measured voltage is checked when the injection pulse width is large enough ensuring the injector pintle has achieved max travel and the injector voltage flux through the coil has reach the max stabilization limit	Injector voltage feedback is not able to detect an opening magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Injector voltage feedback is not able to detect a closing time OR Measured Voltage feedback converted to Injector closing time OR Measured Voltage	= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Opening Magnitude** (See supporting table) >= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Opening Magnitude** (See supporting table) = **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Closing Time** (See supporting table) >=	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Valid (See Definition in Supporting Material below) Injection Pulse Width	= True >= **P02EE P02EF P02F0 P02F1P30D4- Voltage Feedback Rationalities Minimum Pulse Width**	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			feedback converted to Injector closing time	**P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Closing Time** (See supporting table)				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Random Misfire Detected Cylinder 1 Misfire Detected Cylinder 2 Misfire Detected Cylinder 3 Misfire Detected Cylinder 4 Misfire Detected	P0300 P0301 P0302 P0303 P0304	These DTC's will determine if a random or a cylinder specific misfire is occurring by monitoring various terms derived from crankshaft velocity. The rate of misfire over an interval is compared to both emissions and catalyst damaging thresholds. The pattern of crankshaft acceleration after the misfire is checked to differentiate between real misfire and other sources of crank shaft noise. Emissions Neutral Default Action: If consumed Emissions Neutral Default DTCs from other subsystems are set: Ignore Rough Road, Traction, Stability, and Antilock brake signals. If default action not activated, Misfire Monitor could complete less frequently or inaccurately. Default Action Latched for duration of Trip Default Action: If Misfire P030x sets on some hybrid applications, the isolation damper	Crankshaft Deceleration Value(s) vs. Engine Speed and Engine load The equation used to calculate deceleration value is tailored to specific vehicle operating conditions. The selection of the equation used is based on the 1st single cylinder continuous misfire threshold tables encountered that are not max of range. If all tables are max of range at a given speed/load, that speed load region is an ***Undetectable region*** see Algorithm Description Document for additional details. SINGLE CYLINDER CONTINUOUS MISFIRE((Medres_Decel Medres_Jerk OR (Medres_Decel Medres_Jerk OR (Lores_Decel Lores_Jerk OR (Lores_Decel Lores_Jerk OR RevBalanceTime)	- see details of thresholds on Supporting Tables Tab **> RufSCD_Decel** AND **> RufSCD_Jerk)** **> SCD_Decel** AND **> SCD_Jerk)** **> RufCyl_Decel** AND **> RufCyl_Jerk)** **> CylModeDecel** AND **> CylModeJerk)** **>RevMode_Decel**	Engine Run Time Engine Coolant Temp Or If ECT at startup Then System Voltage + Throttle delta - Throttle delta Early Termination option: (used on plug ins that may not have enough engine run time at end of trip for normal interval to complete.)	> 2 crankshaft revolution "ECT" If OBD Max Coolant Achieved = FALSE -12°C< ECT Or if OBD Max Coolant Achieved = TRUE -12°C<ECT< 126°C < -12°C If OBD Max Coolant Achieved = FALSE 21°C < ECT If OBD Max Coolant Achieved = TRUE 21°C < ECT < 126°C 9.00 < volts < 32.00 < 95.00 % per 25 ms < 95.00 % per 25 ms Not Enabled	Emission Exceedence = any (5) failed 200 rev blocks out of (16) 200 rev block tests Failure reported for (1) Exceedence in 1st (16) 200 rev block tests, or (4) Exceedences thereafter. OR when Early Termination Reporting = Enabled and engine rev > 1,000 revs and < 3,200 revs at end of trip	Type B, 2 Trips (Mil Flashes with Catalyst damage level of Misfire)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		between engine and transmission can go into extreme resonance. Default action is to move rpm out of the resonance zone. If default action not activated, significant hardware damage could occur rendering vehicle inoperable.	********** **This Feature not used on Gasoline engines** Combustion Modes that force selection of Idle Tables ********** Other patterns of misfire use adjustments to the single cylinder continuous misfire threshold tables: RANDOM MISFIRE Use random misfire thresholds If no misfire for (Medres_Decel AND Medres_Jerk) OR (Medres_Decel AND Medres_Jerk) OR (Lores_Decel AND Lores_Jerk)	********** **This Feature not used on Gasoline engines** **CombustModeIdleTbl** in Supporting Tables ********** > 6 Engine Cycles **> RufSCD_Decel * Random_SCD_Decel** **> RufSCD_Jerk * Random_SCD_Jerk** **>SCD_Decel * Random_SCD_Decel** **> SCD_Jerk * Random_SCD_Jerk** **> RufCyl_Decel * RandomCylModDecel** **> RufCyl_Jerk * RandomCylModJerk**			any Catalyst Exceedence = (1) 200 rev block as data supports for catalyst damage. Catalyst Failure reported with (1 or 3) Exceedences in FTP, or (1) Exceedence outside FTP. Continuous	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			OR (Lores_Decel AND Lores_Jerk)	**> CylModeDecel * RandomCylModDecel** **> CylModeJerk * RandomCylModJerk**				
			OR RevBalanceTime	**> RevMode_Decel * RandomRevModDecl**				
			PAIRED CYLINDER MISFIRE If a cylinder & it's pair are above PAIR thresholds (Medres_Decel AND Medres_Jerk)	**> RufSCD_Decel * Pair_SCD_Decel** **> RufSCD_Jerk * Pair_SCD_Jerk**				
			OR (Medres_Decel AND Medres_Jerk)	**>SCD_Decel * Pair_SCD_Decel** **> SCD_Jerk * Pair_SCD_Jerk**				
			OR (Lores_Decel AND Lores_Jerk)	**> RufCyl_Decel * PairCylModeDecel** **> RufCyl_Jerk * PairCylModeJerk**				
			OR (Lores_Decel AND Lores_Jerk)	**> CylModeDecel * PairCylModeDecel** **> CylModeJerk * PairCylModeJerk**				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			OR (Revmode Active AND (within one engine cycle: 2nd largest Lores_Decel)	**> CylModeDecel * PairCylModeDecel**				
			BANK MISFIRE Cylinders above Bank Thresholds	>= 3 cylinders				
			(Medres_Decel	**> RufSCD_Decel * Bank_SCD_Decel**				
			AND Medres_Jerk)	**> RufSCD_Jerk * Bank_SCD_Jerk**				
			OR (Medres_Decel	**>SCD_Decel * Bank_SCD_Decel**				
			AND Medres_Jerk)	**> SCD_Jerk * Bank_SCD_Jerk**				
			OR (Lores_Decel	**> RufCyl_Decel * BankCylModeDecel**				
			AND Lores_Jerk)	**> RufCyl_Jerk * BankCylModeJerk**				
			OR (Lores_Decel	**> CylModeDecel * BankCylModeDecel**				
			AND Lores_Jerk)	**> CylModeJerk * BankCylModeJerk**				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CONSECUTIVE CYLINDER MISFIRE 1st cylinder uses single cyl continuous misfire thresholds; 2nd Cylinder uses: (Medres_Decel AND Medres_Jerk) OR (Medres_Decel AND Medres_Jerk) OR (Lores_Decel AND Lores_Jerk) OR (Lores_Decel AND Lores_Jerk)	**> RufSCD_Decel * ConsecSCD_Decel** **> RufSCD_Jerk * ConsecSCD_Jerk** **>SCD_Decel * ConsecSCD_Decel** **> SCD_Jerk * ConsecSCD_Jerk** **> RufCyl_Decel * ConsecCylModDecel** **> RufCyl_Jerk * ConsecCylModeJerk** **> CylModeDecel * ConsecCylModDecel** **> CylModeJerk * ConsecCylModeJerk**				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CYLINDER DEACTIVATION MODE (Active Fuel Managment)					
			AFM: SINGLE CYLINDER CONTINUOUS MISFIRE					
			(CylAfterDeacCyl_Decel	**> CylModeDecel * ClyAfterAFM_Decel**				
			AND					
			CylAfterDeacCyl_Jerk)	**> CylModeJerk * CylAfterAFM_Jerk**				
			OR					
			(CylBeforeDeacCyl_Decel	**> CylModeDecel * CylBeforeAFM_Decel**				
			AND					
			CylBeforeDeacCyl_Jerk)	**> CylModeJerk * ClyBeforeAFM_Jerk**				
			AFM: RANDOM MISFIRE Use random misfire thresholds If no misfire for	> 6 Engine Cycles				
			(CylAfterDeacCyl_Decel	**> CylModeDecel * ClyAfterAFM_Decel * RandomAFM_Decl**				
			AND					
			CylAfterDeacCyl_Jerk)	**> CylModeJerk * CylAfterAFM_Jerk * RandomAFM_Jerk**				
			(CylBeforeDeacCyl_Decel	**> CylModeDecel * CylBeforeAFM_Decel * RandomAFM_Decl**				
			AND					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CylBeforeDeacCyl_Jerk)	**> CylModeJerk * ClyBeforeAFM_Jerk * RandomAFM_Jerk**				
			OR IF option Crank based IMEP estimate is Enabled and CrankBasedJMEP is	Not Enabled < **Misfire_IMEP_Thresh_vs_BinID** (Note: Thresholds uses following tables to pick threshold vs BinID. See supporting tables for more information on how BinID works to select appropriate calibration threshold) **Misfire_IMEP_BinID_vs_RPM_Load Misfire_IMEP_BinID_RPM_Axis Misfire_IMEP_BinID_Load_Axis** - see details on Supporting Tables Tab				
			Misfire Percent Emission Failure Threshold	> 2.38%P0300				
			Misfire Percent Catalyst	>				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Damage When engine speed and load are less than the FTP cals (3) catalyst damage exceedences are allowed.	**Catalyst_Damage_Misfire_Percentage** in Supporting Tables whenever secondary conditions are met. < 1,513 FTP rpm AND < 16 FTP % load	(at low speed/loads, one cylinder may not cause cat damage) Engine Speed Engine Load Misfire counts	> 1,463 rpm AND > 16 % load		
					Engine Speed	600 < rpm < ((Engine Over Speed Limit) - 400) OR 8,191) Engine speed limit is a function of inputs like Gear and temperature see **EngineOverSpeedLimit** in supporting tables	4 cycle delay	
					No active DTCs:	TPS_FA EnginePowerLimited MAF_SensorTFTKO MAP_SensorTFTKO IAT_SensorTFTKO ECT_Sensor_Ckt_TFTKO 5VoltReferenceB_FA CrankSensor_TFTKO CrankSensor_FA CamLctnIntFA CamLctnExhFA	4 cycle delay	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						CamSensorAnyLctnTFTK0 AnyCamPhaser_FA AnyCamPhaser_TFTKO AmbPresDfltdStatus		
					P0315 & engine speed	> 1,000 rpm	4 cycle delay	
					Fuel Level Low	LowFuelConditionDiagnostic	500 cycle delay	
					Cam and Crank Sensors	in sync with each other	4 cycle delay	
					Misfire requests TCC unlock	Not honored because Transmission in hot mode or POPD intrusive diagnostic running	4 cycle delay	
					Fuel System Status	# Fuel Cut	4 cycle delay	
					Active FuelManagement	Transition in progress	0 cycle delay	
					Undetectable engine speed and engine load region	***Undetectable region*** from Malfunction Criteria	4 cycle delay	
					Abusive Engine Over Speed	> 8,192 rpm	0 cycle delay	
					Below zero torque (except CARB approved 3000 rpm to redline triangle.)	**< ZeroTorqueEngLoad** or **<ZeroTorqueAFM** if AFM is active in Supporting Tables	4 cycle delay	
					Below zero torque: TPS Vehicle Speed	< 1.3% (< 100.0% in AFM) >30mph (>318mph AFM)	4 cycle delay	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					NEGATIVE TORQAFM If deactivated cylinders appear to make power, torque is negative: DeactivatedCyl_Decel AND DeactivatedCyl_Jerk AND # of Deact Cyls Inverted	**<DeacCylInversionDecel** **<DeacCylInversionJerk** > 2 cylinders	0 cycle delay	
					Manual Trans Accel Pedal Position AND Automatic transmission shift	Clutch shift > 98.00 %	0 cycle delay 7 cycle delay	
					After Fuel resumes on Automatic shift containing Fuel Cut		2 Cylinder delay	
					Delay if PTC engaged	Enabled	4 cycle delay	
					Delay if error in indices of buffered data is detected and delay is enabled	Delay Enabled	3 cycle delay	
					Delay if IMEP calculation	initializing on startup or running resets (expires before rpm enablement)	4 cycle delay	
					********** **This Feature not used on Gasoline engines**	**********	**********	
					Combustion Mode	**= InfrequentRegen** value in Suooortina Tables_	0 cycle delay	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Driver cranks before Wait to Start lamp extinguishes Brake Torque ********** DRIVELINE RING FILTER After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early. Filter Driveline ring: Stop filter early: ABNORMAL ENGINE SPEED OSCILLATION: (checks each "misfire" candidate in 100 engine Cycle test to see if it looks like some disturbance like rough road (abnormal).) Used Off Idle, and while not shifting, TPS Engine Speed Veh Speed Auto Transmission indivdual candidate deemed abnormal if number of	IF TRUE > 199.99% Max Torque ********** **> "Ring Filter"** # of engine cycles after misfire in Supporting Tables **> "Number of Normals"** # of engine cycles after misfire in Supporting Tables tab > 3 % > 1,000 rpm > 3 mph not shifting	**WaitToStart** cycle delay 0 cycle delay **********	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					consecutive decelerating cylinders after "misfire": (Number of decels can vary with misfire detection equation) Consecutive decels while in SCD Mode Cyl Mode Rev Mode	**> Abnormal SCD Mode** **> Abnormal Cyl Mode** **> Abnormal Rev Mode** in Supporting Tables		
					At the end of 100 engine cycle test, the ratio of abnormal/candidate is checked to confirm if real misfire is present within the 100 engine cycles, abnormal candidates/ total candidates	>0.50 ratio	discard 100 engine cycle test	
					MISFIRE CRANKSHAFT PATTERN RECOGNITION checks each "misfire" candidate in 100 engine Cycle test to see if overall crankshaft pattern looks like real misfire (recognized), or some disturbance like rough road (unrecognized). At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present within			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					the 100 engine cycles. Typically used for checking a single misfire per engine cycle but can support some other patterns on some packages Pattern Recog Enabled: Pattern Recog Enabled during Cylinder Deac Pattern Recog Enabled consecutive cyl pattrn Engine Speed Veh Speed The 1st check for "recognized" is the 1st fired cylinder after the misfire candidate should both accelerate and jerk an amount based acceleration and jerk of Single Cylinder Misfire thresholds in effect at that speed and load. (CylAfter_Accel AND CylAfter_Jerk) Addtionally, the crankhaft_	Enabled Not Enabled Disabled 1,000 < rpm < 6,500 > 3.1 mph > Misfire_ decel * **1st_FireAftrMisfr_Acel** > Misfire_Jerk * **1st_FireAftrMisfr_Jerk** Or if AFM mode is active: > Misfire_ decel * **IstFireAftrMisAcelAFM** > Misfire_Jerk * **IstFireAfterMisJerkAFM**		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					is checked again a small calibratible number of cylinders later to see if the distrubance is still large like rough road, or has calmed down like real misfire. The size of disturbance is compared to a multiplier times the ddtjerk value used to detect misfire at that speed and load. If there is repetitive misfire on consecutive engine cycles, the expected snap is adjusted due to the higher expected disturbance.			
					Num of Cylinders after misfire to start check of crankshaft snap	2 Cylinders		
					"misfire" recognized if: Crankshaft snap after: isolated "misfire"	< Misfire_Jerk * **SnapDecayAfterMisfire**		
					repetative "misfire"	< Misfire_Jerk * **SnapDecayAfterMisfire * RepetSnapDecayAdjst** in Supporting Tables		
					At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present.			
					Ratio of Unrecog/Recog	>0.80	discard 100 engine cycle test	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					**********	**********	**********	
					NON-CRANKSHAFT BASED ROUGH ROAD:	Disabled		
					Rough Road Source	CeRRDR_e_None	**********	
					**********	**********		
					IF Rough Road Source = WheelSpeedlnECM			
					(Wheel speed noise GRABS = OR Traction = OR Vehicle Stability) =	**> WSSRoughRoadThres** active active active	discard 100 engine cycle test	
					AND No Emission Neutral Default Action DTCs	ABS Failed Vehicle Dynamics Control System Status Driven Wheel Rotation Status Non Driven Wheel Rotation Status		
					**********	**********	**********	
					IF Rough Road Source = "FromABS"			
					(RoughRoad = OR ABS = OR Traction = OR Vehicle Stability) =	detected active active active	discard 100 engine cycle test	
					AND No Emission Neutral Default Action DTCs	ABS Failed Vehicle Dynamics Control System Status		
					**********	**********	**********	
					IF Rough Road Source = "TOSS" TOSS dispersion	**>TOSSRoughRoadThres** in supporting tables	discard 100 engine cycle test	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					AND No Active DTCs ********** Default Action Isolator Resonance Default Action Option ********** If Isolator Resonance Option Enabled AND Misfire P030xTFTKO	Transmission Output Shaft Angular Velocity Validity TransmissionEngagedState_FA (Auto Trans only) ClutchPstnSnsr FA (Manual Trans only) ********** Not Enabled ********** Set engine speed limits: 0 < Eng RPM < 8,000	4 cycle delay ********** **********	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position System Variation Not Learned	P0315	This DTC determines if the crankshaft sensor learn values that are stored in memory are valid. The angle between each tooth of the reluctor wheel is learned, and the sum of all angles together should sum to 360° (one revolution of the reluctor wheel). Default values, or corrupted values will not sum to 360°.	The Crankshaft target wheel should be 360 degrees around in circumferance. Loss or controller non-volitile memory or an error in memory will cause the values of individual teeth learn to be defaulted or incorrect. Set the DTC if the Differance between the sum of the reluctor wheel's teeth and 360 degrees is greater than:	> 0.001 degrees	OBD Manufacturer Enable Counter	MEC = 0	0.50 seconds Frequency Continuous100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Performance Per Cylinder	P0324	This diagnostic checks for knock sensor performance out of the normal expected range on a per cylinder basis due to Excessive Knock (either real or false knock). In the knock detection algorithm, the term “Knock Intensity” (KI) is used to define the relative size of a knock event, and is calculated as (KI = current knock event - knock threshold). This results in a KI amplitude that is proportional to the size of the knock event (as seen by the knock sensor). In addition, Knock Intensity cannot be less than zero as it is forced/limited to be = 0 with no knock detected (i.e. whenever the current knock event < knock threshold, KI = 0). This diagnostic calculates a first-order lag filter version of the Knock Intensity and sets a fault when: (Filtered KI) > (Excessive Knock Diagnostic Threshold)	Filtered Knock Intensity (where 'Knock Intensity' = 0 with no knock; and > 0 & proportional to knock magnitude with knock)	**> P0324_PerCyl_ExcessiveKnock_Threshold** (no units)	Diagnostic Enabled? Engine Run Time Engine Speed Engine Air Flow Engine Coolant Temperature or OBD Coolant Enable Criteria Inlet Air Temperature Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	Yes > 0.0 seconds > 400 RPM AND < 8,500 RPM > 0 mg/cylinder AND < 2,000 mg/cylinder > -40 deg's C = TRUE > -40 deg's C > 400 revs	First Order Lag Filters with Weight Coefficient = 0.0400 Updated each engine event	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Circuit Bank 1	P0325	This diagnostic checks for an open in the knock sensor circuit Sensor 1/Bank 1. There are two possible methods used: **1.20 kHz Method:** This method injects a 20 kHz signal (internal to the ECU) onto one of the Knock Sensor inputs. For a normal/ good circuit the 20 kHz signal will propogate through the Knock sensor and back to the ECU through the sensor return circuit. The 20 kHz signal is processed through the Fast Fourier Transform (FFT) and then filtered with a first-order lag filter. Since the Knock Detection algorithm uses a Differential Op-Amp to compare the input from the two knock sensor wires, the FFT 20 kHz diagnostic signal will have either: A. Low output with a good circuit (because the 20 kHz injected signal is detected on both of the sensor inputs) or B, High output for an Open Circuit (because	Open Circuit Method chosen (2 possible methods: 20 kHz or Normal Noise): Filtered FFT Output Filtered FFT Output	= **P0325_P0330_OpenMethod_2** **<u>Case 1 (20 kHz Method):</u>** **>** **P0325_P0330_OpenCktThrshMin (20 kHz)** **AND** **<** **P0325_P0330_OpenCktThrshMax (20 kHz)** **<u>Case 2 (Normal Noise Method):</u>** **>** **P0325_P0330_OpenCktThrshMin (Normal Noise)** **AND** **<** **P0325_P0330_OpenCktThrshMax (Normal Noise)**	Diagnostic Enabled? Engine Run Time Engine Speed Cumulative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow Engine Coolant Temperature or OBD Coolant Enable Criteria Inlet Air Temperature	Yes > 0.0 seconds > 650 RPM and < 8,500 RPM > 100 revs > 40 mg/cylinder and < 2,000 mg/cylinder > -40 deg's C = TRUE > -40 deg's C	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0060 Updated each engine event	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		the 20 kHz injected signal is detected only on one of the sensor inputs). The 20 kHz method is typically used for the entire operating region of the engine. However, some engines may not have adequate separation between good and bad circuits at high engine speed. In these cases the 20 kHz method is used at low and medium engine speeds, and the "Normal Noise" method is used at high engine speed only. 2. **Normal Noise:** The Normal Noise method monitors the background engine noise level for a selected frequency range output of the knock detection FFT. The background noise (i.e. Normal Noise) is filtered with a first-order lag filter. A good circuit is determined when the filtered Normal Noise signal is greater than the threshold. See Supporting Tables for method definition: **P0325_P0330_OoenM**						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		ethod defines which of the two diagnostic methods is used as a fucntion of engine speed (RPM). Typical implementations: A. Use 20 kHz method at allengine RPM (used when acceptable separation achieved at all RPM) or B. Use 20 kHz method at low/medium RPM and Normal Noise at high RPM						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Performance Bank 1	P0326	This diagnostic checks for knock sensor performance out of the normal expected range, on a per sensor basis. This diagnostic is specifically designed to identify the fault condition where the knock sensor is properly attached electrically, but produces an abnormally low output due to being unattached (or loosely attached) with the mounting bolt (and thus unable to properly transfer the engine vibration energy from the engine block to the knock sensor). The term "Abnormal (engine) Noise" is used to define this diagnostic method. A fault condition is identified when a first-order lag filtered version of the Abnormal Noise signal falls below the diagnostic threshold.	Filtered FFT Intensity (where 'FFT Intensity' = Non-knocking, background engine noise for a selected frequency) Filtered FFT Intensity	**<u>Case 1</u>: Engine <u>not</u> in AFM mode** < **P0326_P0331_AbnormalNoise_Threshold** (Supporting Table) OR **<u>Case 2:</u> Engine <u>is</u> in AFM mode** < **P0326_P0331_AbnormalNoise_Thresh_AFM** (Supporting Table; Engine is in AFM mode)	Diagnostic Enabled? Engine Run Time Engine Speed Engine Air Flow Engine Coolant Temperature or OBD Coolant Enable Criteria Inlet Air Temperature Individual Cylinders enabled for Abnormal Noise Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	Yes > 0.0 seconds > 700 RPM(notinAFM mode) OR > 8,500 (in AFM mode) AND < 8,500 RPM > 80mg/cylinder AND < 2,000 mg/cylinder > -40 deg's C = TRUE > -40 deg's C **P0326_P0331-AbnormalNoiseCylsEnabled** (Supporting Table) > 166 Revs	First Order Lag Filters with Weight Coefficient = 0.0100 Updated each engine event	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Circuit Low Bank 1	P0327	This diagnostic checks for an out of range low knock sensor signal. A 3-resistor bias network at each sensor input to the ECM provides a DC diagnostic voltage that will remain within a normal range when the external knock sensor circuit is free of short circuit faults. The diagnostic output is reported as a percentage (0 to 100%) when compared to the 5.0 volt reference voltage.	Sensor Input or Return Signal Line	< 8.0 Percent (of 5.0 Volt reference)	Diagnostic Enabled? Engine Speed	Yes > 0 RPM and < 8,500 RPM	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Circuit High Bank 1	P0328	This diagnostic checks for an out of range high knock sensor signal. A 3-resistor bias network at each sensor input to the ECM provides a DC diagnostic voltage that will remain within a normal range when the external knock sensor circuit is free of short circuit faults. The diagnostic output is reported as a percentage (0 to 100%) when compared to the 5.0 volt reference voltage.	Sensor Input or Return Signal Line	> 39.0 Percent (of 5 Volt Reference)	Diagnostic Enabled? Engine Speed	Yes > 0 RPM and < 8,500 RPM	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Circuit Bank 2	P0330	This diagnostic checks for an open in the knock sensor circuit Sensor 2/Bank 2 There are two possible methods used: **1.20 kHz Method:** This method injects a 20 kHz signal (internal to the ECU) onto one of the Knock Sensor inputs. For a normal/ good circuit the 20 kHz signal will propogate through the Knock sensor and back to the ECU through the sensor return circuit. The 20 kHz signal is processed through the Fast Fourier Transform (FFT) and then filtered with a first-order lag filter. Since the Knock Detection algorithm uses a Differential Op-Amp to compare the input from the two knock sensor wires, the FFT 20 kHz diagnostic signal will have either: A. Low output with a good circuit (because the 20 kHz injected signal is detected on both of the sensor inputs) or B, High output for an	**Individual Sensor Thresholds Enabled?** **Open Circuit Method chosen** (2 possible methods: 20 kHz or Normal Noise): Filtered FFT Output Filtered FFT Output	= o, Use Case 1 and 2 = **P0325_P0330_OpenMethod_2** (supporting table) **<u>Case 1 (20 kHz Method):</u>** **> P0325_P0330_OpenCktThrshMin (20 kHz) AND** **< P0325_P0330_OpenCktThrshMax (20 kHz)** **<u>Case 2 (Normal Noise Method):</u>** **> P0325_P0330_OpenCktThrshMin (Normal Noise) AND** **< P0325_P0330_OpenCktThrshMax (Normal Noise)** **Case 3 (20 kHz Method):**	Diagnostic Enabled? Engine Run Time Engine Speed Cumlative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow Engine Coolant Temperature or OBD Coolant Enable Criteria Inlet Air Temperature	Yes > 0.0 seconds > 650 RPM and < 8,500 RPM ≥ 100 revs > 40 mg/cylinder and < 2,000 mg/cylinder > -40 deg's C = TRUE > -40 deg's C	First Order Lag Filter with Weight Coefficient **Case 1 & 2:** Weight Coefficient = 0.0060 Updated each engine event	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Open Circuit (because the 20 kHz injected signal is detected only on one of the sensor inputs). The 20 kHz method is typically used for the entire operating region of the engine. However, some engines may not have adequate separation between good and bad circuits at high engine speed. In these cases the 20 kHz method is used at low and medium engine speeds, and the "Normal Noise" method is used at high engine speed only. 2. **Normal Noise:** The Normal Noise method monitors the background engine noise level for a selected frequency range output of the knock detection FFT. The background noise (i.e. Normal Noise) is filtered with a first-order lag filter. A good circuit is determined when the filtered Normal Noise signal is greater than the threshold. See Suooortinq Tables	Filtered FFT Output Filtered FFT Output	> **P0330_OpenCktThrshMin2 (20 kHz)** AND < **P0330_OpenCktThrshMax2 (20kHz)** **Case 4 (Normal Noise Method):** > **P0330_OpenCktThrshMin2 (NN)** AND < **P0330_OpenCktThrshMax2 (NN)**			**Case 3 & 4** Weight Coefficient = 0.01 Updated each engine event	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		for method definition: **P0325_P0330_OpenMethod** defines which of the two diagnostic methods is used as a fucntion of engine speed (RPM). Typical implementations: A. Use 20 kHz method at allengine RPM (used when acceptable separation achieved at all RPM) or B. Use 20 kHz method at low/medium RPM and Normal Noise at high RPM For each method the failure thresholds can be the same for both sensors (in a 2 sensor application), or the failure thresholds can be unique to each sensor.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Performance Bank 2	P0331	This diagnostic checks for knock sensor performance out of the normal expected range, on a per sensor basis. This diagnostic is specifically designed to identify the fault condition where the knock sensor is properly attached electrically, but produces an Abnormally low output due to being unattached (or loosely attached) with the the mounting bolt (and thus unable to properly transfer the engine vibration energy from the engine block to the knock sensor). The term "Abnormal (engine) Noise" is used to define this diagnostic method. A fault condition is identified when a first-order lag filtered version of the Abnormal Noise signal falls below the diagnostic threshold. The failure thresholds can be the same for both sensors (in a 2 sensor application), or the failure thresholds can be unique to each sensor.	Individual Sensor Thresholds Enabled? Filtered FFT Intensity (where 'FFT Intensity' = Non-knocking, background engine noise) Filtered FFT Intensity	= 0, Use Case 1 and 2 **Case 1: Engine <u>not</u> in AFM mode** < **P0326_P0331_AbnormalNoise_Threshold** (Supporting Table) OR **Case 2: Engine <u>is</u> in AFM mode** < **P0326_P0331_AbnormalNoise_Thresh_AFM** (Supporting Table) **Case 3: Engine not in AFM mode** < **P0331_AbnormalLo2** (Supporting Table) OR **Case 4: Engine is in AFM mode** < **P0331_AbnormalLoAFM_2** (Supporting Table)	Diagnostic Enabled? Engine Run Time Engine Speed Engine Air Flow Engine Coolant Temperature or OBD Coolant Enable Criteria Inlet Air Temperature Individual Cylinders enabled for Abnormal Noise Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	Yes > 0.0 seconds > 700 RPM(notinAFM mode) OR > 8,500 (in AFM mode) AND < 8,500 RPM > 80mg/cylinder AND < 2,000 mg/cylinder > -40 deg's C = TRUE > -40 deg's C **P0326_P0331-AbnormalNoiseCylsEnabled** (Supporting Table) > 166 Revs	First Order Lag Filter with Weight Coefficient **Case 1 & 2:** Weight Coefficient = 0.0060 Updated each engine event **Case 3 & 4:** Weight Coefficient = 0.01 Updated each engine eventFirst	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Circuit Low Bank 2	P0332	This diagnostic checks for an out of range low knock sensor signal. A 3-resistor bias network at each sensor input to the ECM provides a DC diagnostic voltage that will remain within a normal range when the external knock sensor circuit is free of short circuit faults. The diagnostic output is reported as a percentage (0 to 100%) when compared to the 5.0 volt reference voltage.	Sensor Input or Return Signal Line	< 8.0 Percent (of 5 Volt Reference)	Diagnostic Enabled? Engine Speed	Yes > 0 RPM and < 8,500 RPM	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Knock Sensor (KS) Circuit High Bank 2	P0333	This diagnostic checks for an out of range high knock sensor signal. A 3-resistor bias network at each sensor input to the ECM provides a DC diagnostic voltage that will remain within a normal range when the external knock sensor circuit is free of short circuit faults. The diagnostic output is reported as a percentage (0 to 100%) when compared to the 5.0 volt reference voltage.	Sensor Input or Return Signal Line	> 39.00 Percent (of 5 Volt Reference)	Diagnostic Enabled? Engine Speed	Yes > 0 RPM and < 8,500 RPM	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position (CKP) SensorA Circuit	P0335	Diagnostic will fail if a crank sensor pulse was not received during a period of time; if crank sensor pulses are received the diagnostic will pass.	Time since last crankshaft position sensor pulse received	>= 4.0 seconds	Starter engaged AND (cam pulses being received OR (MAF_SensorFA AND Engine Air Flow	Test is Enabled = FALSE > 0.5 grams/second))	Continuous every 100 msec	Type B, 2 Trips
			No crankshaft pulses received	>= 0.1 seconds	Engine is Running Starter is not engaged	Test is Enabled	Continuous every 12.5 msec	
			No crankshaft pulses received		Engine is Running OR Starter is engaged No DTC Active:	Test is Enabled P0365 P0366	2 failures out of 10 samples One sample per engine revolution	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position (CKP) SensorA Performance	P0336	1. Fail counts will occur if the engine goes out of synchronization repeatedly over a period of time and will pass if the engine stays in synchronization. 2. Diagnostic will fail if synchronization gap is not found in a specified period of time and will pass if the synchronization gap is found. 3. Diagnostic will fail if the incorrect number of crank sensor teeth are detected in-between detecting the synchronization gap and will pass if the correct number of teeth are seen.	Time in which 10 or more crank re-synchronizations occur	< 10.0 seconds	Engine Air Flow Cam-based engine speed No DTC Active:	Test is Enabled >= 0.5 grams/second > 450 RPM P0335	Continuous every 250 msec	Type B, 2 Trips
			No crankshaft synchronization gap found	>= 0.4 seconds	Engine is Running Starter is not engaged	Test is Enabled	Continuous every 12.5 msec	
			Time since starter engaged without detecting crankshaft synchronization gap	>= 1.5 seconds	Starter engaged AND (cam pulses being received OR (MAF_SensorFA AND Engine Air Flow	Test is Enabled = FALSE > 0.5 grams/second))	Continuous every 100 msec	
			Crank pulses received in one engine revolution OR Crank pulses received in one engine revolution	< 1 pulses > 65,535 pulses	Engine is Running OR Starter is engaged No DTC Active:	Test is Enabled P0365 P0366	8 failures out of 10 samples One sample per engine revolution	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor A	P0340	Diagnostic will fail if a cam sensor pulse was not received during a period of time; if cam sensor pulses are received the diagnostic will pass.	Time since last camshaft position sensor pulse received OR Time that starter has been engaged without a camshaft sensor pulse	>= 5.5 seconds >= 4.0 seconds	Starter engaged AND (crank pulses being received OR (MAF_SensorFA AND Engine Air Flow	Test is Enabled = FALSE > 0.5 grams/second))	Continuous every 100 msec	Type B, 2 Trips
			Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Engine is running Starter is not engaged	Test is Enabled	Continuous every 100 msec	
			No camshaft pulses received during 12 MEDRES events (There are 12 MEDRES events per engine cycle) Test begins when MEDRES region AND accumulated number of MEDRES events	= region 3 >= 0 counts	Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	Test is Enabled CrankSensor_FA	Continuous, every MEDRES event unitl test completes, one test at every start attempt	
			The number of camshaft pulses received during 100 engine cycles	= 0 pulses	Crankshaft is synchronized No DTC Active:	Test is Enabled CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Camshaft Position (CMP) Sensor Performance Bank 1 SensorA	P0341	Diagnostic will fail if an incorrect number of cam sensor pulses are detected over a number of engine cycles and will pass if the number of cam pulses is correct.	The number of camshaft pulses received during 12 MEDRES events is OR (There are 12 MEDRES events per engine cycle) Test begins when MEDRES region AND accumulated number of MEDRES events	< 4 pulses > 6 pulses = region 3 >= 0 counts	Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	Test is Enabled CrankSensor_FA	Continuous, every MEDRES event unitl test completes, one test at every start attempt	Type B, 2 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 pulses > 402 pulses	Crankshaft is synchronized No DTC Active:	Test is Enabled CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position Sensor - Crankshaft Start Position Incorrect	P034A	Monitors the position of the crankshaft during auto-start's to verify that the crankshaft is in the expected position- diagnostic will fail if the crankshaft is not in the expected range otherwise the diagnostic will pass	Crankshaft position is in error by a number of crankshaft wheel teeth	> 1 crankshaft teeth	Engine has started rotating during a hybrid auto-start Crankshaft position is being verified No Active DTCs:	Test is Enabled CrankSensor_FA	2 failures out of 3 samples a sample occurs at each hybrid auto-start	Type B, 2 Trips
			Crankshaft position is in error by at least one crankshaft wheel tooth		Engine has started rotating during a hybrid auto-start Crankshaft position is being verified No Active DTCs:	Test is Enabled CrankSensor_FA	4 failures out of 5 samples a sample occurs each hybrid auto-start	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position Sensor - Crankshaft Direction Incorrect	P034B	Detects if the crankshaft is not rotating in the correct direction- will fail if the engine is reported to be spinning backwards while the engine is running otherwise the diagnostic will pass.	Number of crankshaft sensor reversals within a period of time	>= 3 pulses <= 10.0 seconds	Engine Speed Engine Speed Engine Air Flow Engine Movement Detected No Active DTCs:	Test is Enabled > 400 RPM < 2,000 RPM >= 0.5 grams/second CrankSensor_FA	Continuous Every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #1 CIRCUIT	P0351	Diagnoses Cylinder #1 Ignition Control (E8T) output driver circuit for an Open Circuit fault. Controller specific output driver circuit diagnoses the low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 30 kQ impedance between signal and controller ground	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #2 CIRCUIT	P0352	Diagnoses Cylinder #2 Ignition Control (E8T) output driver circuit for an Open Circuit fault. Controller specific output driver circuit diagnoses the low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 30 kQ impedance between signal and controller ground	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #3 CIRCUIT	P0353	Diagnoses Cylinder #3 Ignition Control (E8T) output driver circuit for an Open Circuit fault. Controller specific output driver circuit diagnoses the low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 30 kQ impedance between signal and controller ground	Engine running Ignition Voltage	>11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #4 CIRCUIT	P0354	Diagnoses Cylinder #4 Ignition Control (E8T) output driver circuit for an Open Circuit fault. Controller specific output driver circuit diagnoses the low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 30 kQ impedance between signal and controller ground	Engine running Ignition Voltage	>11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor B	P0365	Diagnostic will fail if a cam sensor pulse was not received during a period of time; if cam sensor pulses are received the diagnostic will pass.	Time since last camshaft position sensor pulse received OR Time that starter has been engaged without a camshaft sensor pulse	>= 5.5 seconds >= 4.0 seconds	Starter engaged AND (crank pulses being received OR (MAF_SensorFA AND Engine Air Flow	Test is Enabled = FALSE > 0.5 grams/second))	Continuous every 100 msec	Type A, 1 Trips
			Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Engine is running Starter is not engaged	Test is Enabled	Continuous every 100 msec	
			No camshaft pulses received during 12 MEDRES events (There are 12 MEDRES events per engine cycle) Test begins when MEDRES region AND accumulated number of MEDRES events	= region 3 >= 0 counts	Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	Test is Enabled CrankSensor_FA	Continuous, every MEDRES event unitl test completes, one test at every start attempt	
			The number of camshaft pulses received during 100 engine cycles	= 0 pulses	Crankshaft is synchronized No DTC Active:	Test is Enabled CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Camshaft Position (CMP) Sensor Performance Bank 1 Sensor B	P0366	Diagnostic will fail if an incorrect number of cam sensor pulses are detected over a number of engine cycles and will pass if the number of cam pulses is correct.	The number of camshaft pulses received during 12 MEDRES events is OR (There are 12 MEDRES events per engine cycle) Test begins when MEDRES region AND accumulated number of MEDRES events	< 4 pulses > 6 pulses = region 3 >= 0 counts	Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	Test is Enabled CrankSensor_FA	Continuous, every MEDRES event unitl test completes, one test at every start attempt	Type A, 1 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 pulses > 402 pulses	Crankshaft is synchronized No DTC Active:	Test is Enabled CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Catalyst System Low Efficiency Bank 1 - Intrusive (legacy)	P0420	INTRUSIVE CATALYST MONITOR ALGORITHM (a deceleration fuel cutoff condition triggers the diagnostic at least once per trip) Oxygen Storage concept: The catalyst washcoat contains Cerium Oxide which reacts with NO and 02 during lean A/F excursions to store the excess oxygen (Le. Cerium Oxidation). During rich A/F excursions, Cerium Oxide reacts with CO and H2 to release this stored oxygen (I.e. Cerium Reduction). This condition is defined as Oxygen Storage Capacity (OSC). The CatMon strategy involves a “measure” of OSC by intrusive Rich A/F followed by Lean A/F excursions (due to decel fuel cutoff). A Normalized Ratio of 1 indicates a good part and a ratio of 0 indicates a very bad part. Normalized Ratio Calculation = (C1-C2) / (C3-C2)	Normalized Ratio OSC Value (See P0420 Normalized OSC Ratio calc tab) (the EWMA calculation uses a 0.10 coefficient)	< 0.35	A1) Core catalyst diagnostic is A2) TWC Passive Observer diagnostic Disabled ? B) Enable criteria : See Trouble Code P2270 - (02 Sensor Signal Stuck Lean Bank 1 Sensor 2) ---------- C) Rapid Step Response (RSR) feature will initiate multiple tests: C1) If the difference between current EWMA value and the current OSC Normalized Ratio value is C2) and the current OSC Normalized Ratio value is C3) while the number of RSR tests is (maximum number of tests allowed to detect failure after RSR is triggered) ---------- D1) Mass Air Flow is D2) and Mass Air Flow is E) Predicted catalyst temperature F) Pre-catalyst 02 Sensor or Pre-cat WRAF Sensor	A1) Enabled A2) Check : Disabled C1)>0.64 sec C2) <0.10 sec C3) < 10 counts ---------- D1)> 2.00 g/s D2)< 20.00 g/s E) < 850 deg C F) > 825.00 mV or > 1.07 EQR	1 test attempted per valid decel period Minimum of 1 test per trip Maximum of 3 tests per trip Frequency: Fueling Related : 12.5 ms OSC Measurements: 100 ms Temp Prediction: 12.5ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		where C1: Raw OSC Calculation = (post-cat 02 Response time) - (pre-cat 02 Response time) C2: BestFailing OSC value:: calibration table (based on temp and exhaust gas flow) C3: WorstPassing OSC value : calibration table (based on temp and exhaust gas flow) The Intrusive Catalyst Monitoring test is completed during a decel fuel cutoff event following a rich instrusive fueling event which is initiated by the 02 Sensor Signal Stuck Lean Bank 1 Sensor 2 test (See P2270 conditions for details)			G) Post-catalyst 02 Sensor ---------- General Enable Criteria: In addition to Code P2272 conditions, the following Code Bundles shall not be true : H1) For Switching 02 Sensors: H2) ForWRAF Sensors:	G) > 700.00 mV ---------- H1) O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA H2) WRAF_Bank_1_FA, WRAF_Bank_2_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission (EVAP) System Small Leak Detected (No ELCP - Conventional EVAP Diagnostic - with EAT using OAT Sensor - with Fuel Tank Zome Module (FTZM))	P0442	This DTC will detect a small leak (> 0.020") in the EVAP system between the fuel fill cap and the purge solenoid. On some applications a small leak is defined as > 0.025", 0.030", or 0.150". The engine off natural vacuum method (EONV) is used. EONV is an evaporative system leak detection diagnostic that runs when the vehicle is shut off when enable conditions are met. Prior to sealing the system and performing the diagnostic, the fuel volatility is analyzed. In an open system (Canister Vent Solenoid [CVS] open) high volatility fuel creates enough flow to generate a measurable pressure differential relative to atmospheric.After the volatility check, the vent solenoid will close. After the vent is closed, typically a build up of pressure from the hot soak begins (phase-1). The pressure typically will peak and then begin to decrease as the fuel cools. When	The total delta from peak pressure to peak vacuum during the test is normalized against a calibration pressure threshold table that is based upon fuel level and ambient temperature. (Please see **P0442 EONV Pressure Threshold (Pascals)** in Supporting Tables). The normalized value is calculated by the following equation: 1 - (peak pressure - peak vacuum) / pressure threshold. The normalized value is entered into EWMA (with 0= perfect pass and 1= perfect fail). When EWMA is the DTC light is illuminated. The EWMA calculation uses a 0.14 weighting coefficient. The DTC light can be turned off if the EWMA is and stays below the EWMA fail threshold for 3 additional consecutive trips.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		the pressure drops (-62) Pa from peak pressure, the vent is then opened for 60 seconds to normalize the system pressure. The vent is again closed to begin the vacuum portion of the test (phase-2). As the fuel temperature continues to fall, a vacuum will begin forming. The vacuum will continue until it reaches a vacuum peak. When the pressure rises 62 Pa from vacuum peak, the test then completes. If the key is turned on while the diagnostic test is in progress, the test will abort.			Ambient Temperature Using OAT Sensor to be Valid ********** 1. Startup OAT is less than previous trip EAT OR 2. Startup ECT - previous trip EAT OR 3. Engine off time OR 4. At startup, time since previous EAT valid and able to learn OR 5. EAT - current OAT OR 6. EAT < current OAT and speed timer and current OAT - EAT Speed timer increments at 100 msec rate and increments vary based on vehicle speed as follows: vehicle speed < 10mph 10 mph<speed< 35 mph 35mph<speed<124 124mph<speed< 124 Speed timer can never be less than 0 seconds ********** 1. High Fuel Volatility	********** < 0 °C > 7,200 seconds < 3,600 seconds 0 °C < difference < 2 °C > 240 seconds < 2 °C -0.2 seconds 0.10 seconds 0.20 seconds 0.20 seconds **********		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					During the volatility phase, pressure in the fuel tank is integrated vs. volatility time. If the integrated pressure is then test aborts and unsuccessful attempts is incremented. This value equates to an average integrated fuel tank pressure > 1,245 Pa. Please see **P0442 Volatility Time as a Function of Estimate of Ambient Temperature** in Supporting Tables. OR 2. Vacuum Refueling Detected See P0454 Fault Code for information on vacuum refueling algorithm. OR 3. Fuel Level Refueling Detected See P0464 Fault Code for information on fuel level refueling. OR 4. Vacuum Out of Range and No Refueling See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for	< -5		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					information on fuel level refueling. OR 5. Vacuum Out of Range and Refueling Detected See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for information on fuel level refueling. OR 6. Vent Valve Override Failed Device control using an off-board tool to control the vent solenoid, cannot exceed during the EONV test OR 7. Key up during EONV test No active DTCs: No Active DTCs TFTKO	0.50 seconds MAF_SensorFA ECT_Sensor_FA IAT_SensorFA VehicleSpeedSensor_FA ModuleOffTime_FA AmbientAirDefault FuelLevelDataFault P0443 P0446 P0449 P0452 P0453 P0455		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						P0458 P0459 P0498 P0499 P0496 P1001 P1005 P11FF P130F U18A2		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission (EVAP) Canister Purge Solenoid Valve Circuit (ODM) (No ELCP - Conventional EVAP Diagnostic)	P0443	Controller specific output driver circuit diagnoses the canister purge solenoid low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 200 K Q impedance between output and controller ground.	Diagnostic is Enabled Powertrain relay voltage	Voltage >11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0458 may also set (Canister Purge Solenoid Short to Ground)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission (EVAP) Vent System Performance (No ELCP - Conventional EVAP Diagnostic - with purge pump - with Fuel Tank Zone Module (FTZM))	P0446	This DTC will determine if a restriction is present in the vent solenoid, vent filler, vent hose or EVAP canister. This diagnostic runs with normal purge control and canister vent solenoid commanded open. The diagnostic fails when the FTP sensor vacuum measurement is above a vacuum threshold before it accumulates purge volume above a threshold. The diagnostic passes when it accumulates purge volume above a threshold before the FTP sensor vacuum measurement is above a vacuum threshold.	Vent Restriction Prep Test: Vented Vacuum for OR Vented Vacuum for Vent Restriction Test: Tank Vacuum for before Purge Volume After setting the DTC for the first time, 0 liters of fuel must be consumed before setting the DTC for the second time.	< -623 Pa 60 seconds > 1,245 Pa 60 seconds > refer to **P0446 canister vent restriction test tank vacuum threshold** in Supporting Tables. Calibration threshold (Pa) for canister vent restriction as function (baro) 5 seconds > refer to **P0446 canister vent restriction test displaced purge volume limit** in Supporting Tables. Calibration threshold (liters) for canister vent restriction as function (baro)	Diagnostic is Enabled Fuel Level System Voltage Startup IAT Startup ECT Barometric Pressure P146C EVAP Purge Pump System Misassembled diagnostic is not running No active DTCs: No Active DTCs TFTKO	10 % < Percent < 90% > 10.0 volts 4 °C<Temperature<35 °C <35 °C >70 kPa MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited FuelLevelDataFault EvapPurgeSolenoidCircuit_FA EvapVentSolenoidCircuit_FA FTP_SensorCircuit_FA PurgePumpDiag_FA Purge Pump LIN Communication Fault Active P0443 P0449 P0452 P0453 P0454 P0458 P0459 P0498 P0499 P1001	Once per Cold Start Time is dependent on driving conditions Maximum time before test abort is 1,400 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						P1005 P11FF P130F U18A2		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission (EVAP) Vent Solenoid Control Circuit (ODM) (No ELCP - Conventional EVAP Diagnostic - with Fuel Tank Zone Module (FTZM))	P0449	Controller specific output driver circuit diagnoses the vent solenoid low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	> 200 K Q impedence between output and controller ground	Diagnostic is Enabled No active DTCs:	P1005 P130F U18A2	50 failures out of 63 samples 100 ms /sample	Type B, 2 Trips Note: In certain controlle rs P0498 may also set (Vent Solenoid Short to Ground)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Tank Pressure (FTP) Sensor Circuit Performance (No ELCP - Conventional EVAP Diagnostic)	P0451	The DTC will be set if the fuel tank vacuum sensor is out of range when it tries to re-zero prior to the phase-1 or phase-2 portions of the engine-off natural vacuum small leak test. During the EONV test, the fuel tank vacuum sensor is re-zeroed. A re-zero occurs: 1) At the transition from the volatility phase to the pressure phase. 2) At the transition from the pressure phase to the vacuum phase. The re-zero test determines if the tank vacuum signal falls within a calibratable window about atmospheric pressure. If after some time, the tank vacuum signal does not fall to within the window, the re-zero test exits to the refueling rationality test. The refueling rationality test determines if a refueling event caused the re-zero problem. If so, the re-zero problem is ignored. If a refueling event is not	The tank vacuum sensor voltage is compared to a window about the nominal sensor voltage offset (~1.5 volts) Upper voltage threshold (voltage addition above the nominal voltage) Lower voltage threshold (voltage subtraction below the nominal voltage) The difference between tank vacuum sensor voltage and the nominal offset voltage is then normalized against the appropriate threshold listed above to produce a ratio between 0.0 and 1.0. This normalized re-zero ratio is then filtered with a EWMA (with 0= perfect pass and 1=perfect fail). When EWMA is the DTC light is illuminated. The EWMA calculation uses a 0.20 weighting coefficient. The DTC light can be turned off if the EWMA is and stays below the	0.2 volts 0.2 volts > 0.73 (EWMA Fail Threshold), <0.40 (EWMA Re-Pass Threshold)	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The number of times that it executes can range from zero to two per engine-off period.The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.	Type A, 1 Trips EWMA Average run length: 6 Run length is 2 trips after code clear or non-volatile reset

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		detected, then the results of the re-zero test are used to determine if there is a re-zero problem. 1) An individual re-zero test generates a re-zero ratio. The ratio goes from 0.0 to 1.0. 2) A 0.0 means that the re-zero pressure signal achieved exactly atmospheric pressure. 3) A ratio of 1.0 means that the re-zero pressure did not get within the window. 4) Re-zero pressure within the window generates values between 0.0 and 1.0. If a refueling event is not detected, then the resulting re-zero ratio is filtered using an exponentially weighted moving average (EWMA). When the EWMA exceeds a fail threshold, the vacuum re-zero test reports a failure. Once the vacuum re-zero test fails, the EWMA fall below a lower re-pass threshold before it can pass the vacuum re-zero test again.	EWMA fail threshold for 3 additional consecutive trips.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage (No ELCP - Conventional EVAP Diagnostic - with Fuel Tank Zone Module (FTZM))	P0452	This DTC will detect a Fuel Tank Pressure (FTP) sensor signal that is too low out of range. The FTP sensor circuit out of range diagnostic compares the raw sensor voltage to a lower voltage threshold. It is an X out of Y diagnostic that runs continuously anytime the controller is awake. If the sensor voltage is below the lower voltage threshold, the low fail counter then increments. If the low fail counter reaches its threshold then a fail is reported for P0452 DTC. A pass is reported for P0452 DTC if the low sample counter reaches its threshold.	FTP sensor signal The normal operating range of the FTP sensor is 0.5 volts (-1245 Pa) to 4.5 volts (- -3736 Pa).	< 0.15 volts (3.0 % of Vref or -1,495 Pa)	No active DTC's:	P1001 P1005 U18A2	640 failures out of 800 samples 12.5 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Tank Pressure (FTP) Sensor Circuit High Voltage (No ELCP - Conventional EVAP Diagnostic - with Fuel Tank Zone Module (FTZM))	P0453	This DTC will detect a Fuel Tank Pressure (FTP) sensor signal that is too high out of range. The FTP sensor circuit out of range diagnostic compares the raw sensor voltage to an upper voltage threshold. It is an X out of Y diagnostic that runs continuously anytime the controller is awake. If the sensor voltage is above the upper voltage threshold, the high fail counter then increments. If the high fail counter reaches its threshold then a fail is reported for P0453 DTC. A pass is reported for P0453 DTC if the high sample counter reaches its threshold.	FTP sensor signal The normal operating range of the FTP sensor is 0.5 volts (-1245 Pa) to 4.5 volts (- -3736 Pa).	> 4.85 volts (97.0 % of Vref or - -3,985 Pa)	No active DTCs:	P1001 P1005 U18A2	640 failures out of 800 samples 12.5 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Tank Pressure (FTP) Sensor Circuit Intermittent (No ELCP - Conventional EVAP Diagnostic)	P0454	This DTC will detect intermittent tank vacuum sensor signals that would have caused the engine-off natural vacuum small leak test to abort due to an apparent re-fueling event. During the EONV test, an abrupt change in fuel tank vacuum is identified as a possible refueling event. If the abrupt change occurs while the vent valve is closed, the EONV small-leak test aborts and the refueling rationality test starts. If the refueling rationality test detects a refueling event, then the vacuum change is considered “rational.” If the refueling rationality test does not detect a refueling event, then the vacuum change is considered “irrational.” The vacuum change rationality diagnostic is an “X out of Y” test. 1) Each time the EONV test completes, the (Y) sample counter is incremented. 2) Each time the	If an abrupt change in tank vacuum is detected the engine-off natural vacuum test is aborted due to an apparent refueling event. Subsequent to the abort, a refueling rationality test is executed to confirm that a refueling event occurred. If a refueling is confirmed, then the test sample is considered passing. Otherwise, the sample is considered failing indicating an intermittent signal problem. An abrupt change is defined as a change in vacuum in the span of 1.0 seconds. But in 12.5 msec. A refueling event is confirmed if the fuel level has a persistent change of for 30 seconds during a 600 second refueling rationality test.	> 112 Pa < 249 Pa >15 %	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes and the canister vent solenoid is closed		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period.The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.The test will report a failure if 2 out of 3 samples are failures. 12.5 ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		rationality test has an irrational result; the (X) fail counter is incremented. 3) If the (X) fail counter reaches the fail limit before the (Y) sample counter reaches the sample limit, the vacuum change rationality test fails. 4) If the (Y) sample counter reaches the limit before the (X) fail counter fails, the vacuum change rationality test passes.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission (EVAP) System Large Leak Detected (No ELCP - Conventional EVAP Diagnostic - with Purge Pump - with Fuel Tank Zone Module (FTZM))	P0455	This DTC will detect a weak vacuum condition (large leak or purge blockage) in the EVAP system. This mode checks for large leaks and blockages when proper driving conditions are met. If these conditions are met, the diagnostic commands the vent valve closed and controls the purge duty cycle to allow purge flow to purge the fuel tank and canister system while monitoring the fuel tank vacuum level. The algorithm accumulates purge flow during the test to determine a displaced purge volume as the test proceeds. If the displaced purge volume reaches a threshold before the fuel tank vacuum level reaches its passing threshold, then a large leak failure is detected. On fuel systems with fuel caps If the first failure of	Purge volume while Tank vacuum After setting the DTC for the first time, 0 liters of fuel must be consumed before setting the DTC for the second time.	> refer to **P0455 large leak diagnostic displaced purge volume threshold** in Supporting Tables. Calibration threshold (liters) for large leak diagnostic as function of barometric pressure (kPa) < refer to **P0455 large leak diagnostic tank vacuum threshold** in Supporting Tables. Calibration threshold (Pa) for large leak diagnostic as function of barometric pressure (kPa)	Diagnostic is Enabled Fuel Level System Voltage Barometric Pressure Purge Flow No active DTCs: No Active DTCs TFTKO If ECT > IAT, Startup	10 % < Percent < 90 % > 10.0 volts >70 kPa >3.00% MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited FuelLevelDataFault EvapPurgeSolenoidCircuit_FA EvapVentSolenoidCircuit_FA FTP_SensorCircuit_FA PurgePumpDiag_FA Purge Pump LIN Communication Fault Active P0443 P0449 P0452 P0453 P0454 P0458 P0459 P0498 P0499 P1001 P1005 P11FF P130F U18A2	Once per cold start Time is dependent on driving conditions Maximum time before test abort is 1,400 seconds Weak Vacuum Follow-up Test With large leak detected, the follow-up test is limited toO seconds. Once the MIL is on, the follow-up test runs indefinitely.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		P0455 occurred after a refueling event was detected and the MIL is off for P0455, the MIL will be commanded off after the first pass of P0455 is reported. If the first failure of P0455 did not occur after a refueling event was detected, the MIL will be commanded off on the ignition cycle after the third consecutive pass of P0455 is reported.the MIL will be commanded off on the ignition cycle after the third consecutive pass of P0455 is reported. On fuel systems without fuel caps The P0455 MIL will be commanded off on the ignition cycle after the third consecutive pass of P0455 is reported.	Weak Vacuum Follow-up Test (fuel cap replacement test) Weak Vacuum Test failed. Passes if tank vacuum Note: Weak Vacuum Follow-up Test can only report a pass.	> 2,740 Pa	temperature delta (ECT-IAT): Startup IAT Startup ECT Weak Vacuum Follow-up Test This test can run following a weak vacuum failure or on a hot restart.	<8 °C 4 °C<Temperature<35 °C <35 °C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission System Purge Control Valve Circuit Low (No ELCP - Conventional EVAP Diagnostic)	P0458	Controller specific output driver circuit diagnoses the canister purge solenoid low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 0.5 Q impedence between output and controller ground	Diagnostic is Enabled Powertrain relay voltage	Voltage >11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0443 may also set (Canister Purge Solenoid Open Circuit)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission System Purge Control Valve Circuit High (No ELCP - Conventional EVAP Diagnostic)	P0459	Controller specific output driver circuit diagnoses the canister purge solenoid low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 0.5 Q impedence between output and controller power	Diagnostic is Enabled Powertrain relay voltage	Voltage >11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 1 Performance (For use on vehicles with two fuel senders and mechanical transfer pump)	P0461	This DTC will detect a primary fuel tank level sensor stuck in-range.	1) ********** Fuel Level in Primary and Secondary Tanks Remain in an Unreadable Range too Long ********** 1a) If Deadband diagnostic subtest enabled 1b) If fuel volume in primary tank is 1c) and if fuel volume in secondary tank is 1d) and if 1b and 1c indications do not change while fuel volume consumed by engine is OR 2) ********** Fuel consumed without a Primary Fuel Level Change ********** 2a) If indicated fuel volume change is 2b) while fuel consumed by the engine is	1a) == Enabled status 1b) >43.9 liters 1c) <4.8 liters 1d) > 14.2 liters 2a) < 3 liters 2b) > 9.8 liters	1a) Diagnostic is Enabled 1b) Engine Operational State 1c) Device control state for the electric transfer pump 2a) Diagnostic is Enabled	1b) == Running 1c) ==False	250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 1 Circuit Low Voltage (For use on vehicles with a fuel float connected to an FTZM)	P0462	This DTC will detect a primary fuel tank sensor out-of-range low.	Fuel level Sender % of 5V range	<10%	a) Diagnostic is Enabled b) Fuel Level Sensor Initialized status c) Fuel Level Sensor Data Available Status d) Communication faults status	b) == True c) == True d) <> True	40 failures out of 50 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 1 Circuit High Voltage (For use on vehicles with a fuel float connected to an FTZM)	P0463	This DTC will detect a primary fuel tank level sensor out-of-range high.	Fuel level Sender % of 5V range	> 60 %	a) Diagnostic is Enabled b) Fuel Level Sensor Initialized status c) Fuel Level Sensor Data Available Status d) Communication faults status	b) == True c) == True d) <> True	40 failures out of 50 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 1 Circuit Intermittent (No ELCP - Conventional EVAP Diagnostic)	P0464	This DTC will detect intermittent fuel level sensor signals that would have caused the engine-off natural vacuum small leak test to abort due to an apparent re-fueling event. During the EONV test, a change in fuel level is identified as a possible refueling event. If the change occurs while the vent valve is closed, the EONV small-leak test aborts and the refueling rationality test starts. If the refueling rationality test detects a refueling event, the fuel level change is considered “rational.” If the refueling rationality test does not detect refueling, the fuel level change is considered “irrational.” The fuel level change rationality diagnostic is an “X out of Y” test. 1) Each time the EONV test completes, the (Y) sample counter is incremented. 2) Each time the rationality test has an	If a change in fuel level is detected, the engine-off natural vacuum test is aborted due to an apparent refueling event. Subsequent to the abort, a refueling rationality test is executed to confirm that an actual refueling event occurred. If a refueling event is confirmed, then the test sample is considered passing. Otherwise, if a refueling event is not confirmed, then the test sample is considered failing which indicates an intermittent signal problem. An intermittent fuel level signal problem is defined as: The fuel level changes by and does not remain for 30 seconds during a 600 second refueling rationality test.	 >15% >15%	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period.The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.The test will report a failure if 2 out of 3 samples are failures. 100 ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		irrational result; the (X) fail counter is incremented. 3) If the (X) fail counter reaches the fail limit before the (Y) sample counter reaches the sample limit, the fuel level change rationality test fails. 4) If the (Y) sample counter reaches the limit before the (X) fail counter fails, the fuel level change rationality test passes.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan Speed Low [LIN Bus Electric/ PWM Fans Only- Internal or External controller]	P0494	This diagnostic is to detect if the fan system is undercooling. It does so by determining if the measured fan speed is sufficiently lower than the expected fan speed. The expected fan speed is modeled applying startup/ rampup/transport time delays, applying rate limiting to increasing and decreasing fan commands, and applying supply voltage compensation. If the actual fan speed is lower than the modeled fan speed by a calibratable threshold, the fault maturation for the corresponding DTC increments. The diagnostic employs a standard “X of Y” approach, where the diagnostic reports a failure to the diagnostic data manager if "X" faulted evaluations occur within each test consisting of "Y" samples. Only after first diagnostic activation per key cycle, the fan will be held commanded on for enough time to ensure this monitor has an	This DTC compares the Measured Fan Speed and the Expected Fan Speed and ensures that it falls withing an acceptable margin of error (low side error comparison)	<= Speed Low Limit [Supporting Table] **P0494_LIN_Threshold**	a] Diagnostic Enabled b] Fan Commanded On c] Diagnostic System Disabled(via service tool) d] Battery Voltage In-Range e] LIN Bus based Fan Operation Enabled f] LIN Bus Lost Communication Fault Active (DTC U063200) g] LIN Bus Continuous Operation Fault Active (DTCP135C) h] Fan Our of Range High Fault Active (DTC P30EF) i] Fan Out Of Range Low Fault Active (DTC P30EE) j] Fan speed is above a min fan speed threshold (rpm)	a] =1 [True if 1; False if 0] b] =TRUE c] =FALSE d] =TRUE e] =TRUE f] =FALSE g] =FALSE h] = FALSE i] = FALSE j] >=750.00	16 failures/ 20 samples; 1000 ms/ sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		opportunity to mature a decision.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission (EVAP) System Flow During Non-Purge (No ELCP - Conventional EVAP Diagnostic - with purge pump - with Fuel Tank Zone Module (FTZM))	P0496	This DTC will determine if the purge valve solenoid is leaking into the induction system or is leaking between the purge pump and purge valve solenoid. It does this by sealing the EVAP system (purge and vent valve closed) and then monitors fuel tank vacuum level. The fuel tank vacuum level should not increase. If tank vacuum increases above a threshold, a malfunction is indicated. Additional Information The purge valve leak diagnostic exists to helps service replace leaking purge valves that could otherwise be detected with the EONV small leak diagnostic (P0442).	Tank Vacuum for Test time	> refer to **P0496 purge valve leak diagnostic vacuum threshold** in Supporting Tables. Calibration threshold (Pa) for purge valve leak diagnostic as func (baro) as a function of barometric pressure (kPa) 5 seconds < refer to **P0496 purge valve leak test time as a function of fuel level and barometric pressure** in Supporting Tables. Test time only increments when engine vacuum > 10.0 kPa.	Diagnostic is Enabled Fuel Level System Voltage Barometric pressure Startup IAT Startup ECT Engine Off Time Initial purge pump pressure P146C EVAP Purge Pump System Misassembled diagnostic is not running Purge pump over tempertaure status is False No active DTCs: No pending DTCs:	10 % < Percent < 90 % > 10.0 volts > 70 kPa 4 °C<Temperature<35 °C <35 °C >28,800.0 seconds >3.1 kPa MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited FuelLevelDataFault EvapPurgeSolenoidCircuit_FA EvapVentSolenoidCircuit_FA FTP_SensorCircuit_FA PurgePumpDiag_FA Purge Pump LIN Communication Fault Active	Once per cold start Cold start: max time is 1,400 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No Active DTC's TFTKO	Purge Pump LIN Communication Fault Pending P0443 P0449 P0452 P0453 P0454 P0458 P0459 P0498 P0499 P1001 P1005 P11FF P130F U18A2		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission System Vent Solenoid Control Circuit Low (No ELCP - Conventional EVAP Diagnostic - with Fuel Tank Zone Module (FTZM))	P0498	Controller specific output driver circuit diagnoses the vent solenoid low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 0.5 Q impedence between output and controller ground	Diagnostic is Enabled No active DTC's:	P1005 P130F U18A2	50 failures out of 63 samples 100 ms /sample	Type B, 2 Trips Note: In certain controlle rs P0449 may also set (Vent Solenoid Open Circuit)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Evaporative Emission System Vent Solenoid Control Circuit High (No ELCP - Conventional EVAP Diagnostic - with Fuel Tank Zone Module (FTZM))	P0499	Controller specific output driver circuit diagnoses the vent solenoid low sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds. If the P0499 is active, an intrusive test is performed with the vent solenoid commanded closed for 15 seconds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 0.5 Q impedence between output and controller power	Diagnostic is Enabled No active DTC's:	P1005 P130F U18A2	50 failures out of 63 samples 100 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankcase Ventilation System Disconnecte d	P04DB	The Crankcase Ventilation System Disconnected Diagnostic monitors the performance of the Positive Crankcase Ventilation (PCV) System. After the enable conditions are met, this monitor will will evaluate the signal of the Crankcase Ventilation Pressure sensor. This sensor is mounted in the PCV hose between the crankcase and the engine induction system. During normal operation, the sensor will see a pressure drop that varies in conjunction with the engine airflow. Additionally, the sensor will see pressure pulses as the cylinders go up and down in the crankcase. This monitor evaluates both the signal offset based on the pressure drop, and the signal noise based on the pressure pulses. The product of the	ScaledSignalLo * ScaledNoiseLo or ScaledSignalHi * ScaledNoiseHi Where ScaledSignalLo = Where ScaledNoiseLo = Where ScaledSignalHi =	< 1.00 kPa * kPa > 9,999.00 kPa * kPa Average Crankcase Ventilation Pressure Signal value calculated over the sample period and normalized as a function of engine air flow based on table **P04DB: Crankcase Pressure Signal Normalization for Air Flow, low case** 0.00 kPa is subtracted from the normalized value. The absolute value of the result is taken to get the final ScaledSignalLo. Average Crankcase Ventilation Pressure Signal delta calculated over the sample period and normalized as a function of engine speed based on table **P04DB: Crankcase Pressure Noise Normalization for Engine Speed, low case** Average Crankcase Ventilation Pressure	Diagnostic is Enabled Outside Air Temperature Engine Coolant Temperature Barometric Pressure <u>Stability conditions:</u> Engine Air Flow Engine Air Flow Engine Vacuum Engine Vacuum Engine Speed Engine Speed Maximum Engine Air Flow - Minimum Engine Air Flow over the sample period Engine Manifold Pressure (MAP) Transient Active MAP Transient Delay <u>MAP Transient Active</u> = TRUE when: Engine Speed Engine Speed MAP Delta over 100 msec <u>MAP Transient Delay</u> = TRUE for a period of time after MAP Transient Active becomes FALSE. This time is determined	 >= -9.0 Degrees C >= 60.0 Degrees C >= 70.0 kPa >= 75.0 Grams/Second <= 160.0 Grams/Second >= -130.0 kPa <= -10.0 kPa >= 2,000 RPM <= 4,600 RPM <= 20.0 Grams/Second = FALSE = FALSE > 9,999 RPM < 9,999 RPM > MAP Transient Delta Threshold which is a function of engine speed based on table **P04DB: MAP Transient Delta Threshold**	The DTC will fail immediately if the malfunction criteria are met	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		signal offset and signal noise is compared to a calibration threshold during certain engine operating conditions. If this product is between two failure thresholds, the system is operating as expected, and the monitor passes. If the product is outside of the two failure thresholds, the system is disconnected, and the monitor fails.	Where ScaledNoiseHi = The Crankcase Ventilation Pressure Sensor is sampled every 3.125 msec to calculate ScaledSignalLo/Hi and ScaledNoiseLo/Hi. ScaledSignalLo/Hi and ScaledNoiseLo/Hi values are accumulated over a period of 0.5 Seconds.	Signal value calculated over the sample period and normalized as a function of engine air flow based on table **P04DB: Crankcase Pressure Signal Normalization for Air Flow, high case** 0.00 kPa is subtracted from the normalized value. The absolute value of the result is taken to get the final ScaledSignalHi. Average Crankcase Ventilation Pressure Signal delta calculated over the sample period and normalized as a function of engine speed based on table **P04DB: Crankcase Pressure Noise Normalization for Engine Speed, high case**	as a function of the maximum MAP Delta measured while MAP Transient Active = TRUE, and is based on table **P04DB: MAP Transient Delay Active Time** ---------- Time that stability conditions must be met prior to sampling data Data is sampled over a period of time Stability conditions must continue to be met as the data sample is collected. A data sample may accumulate data from multiple sample windows. <u>DTCs Active:</u> <u>DTCs Pending:</u>	---------- = 0.5 Seconds = 0.5 Seconds MAF_SensorFA MAP_SensorFA OAT_PtEstFiltFA AmbPresDfltdStatus ECT_Sensor_FA PCV_Sensor_FA PCV_Sensor_Circuit_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankcase Ventilation Hose Connection Sensor Circuit Low	P04E2	Detects a continuous open or short to ground in the Crankcase Ventilation Pressure signal circuit by monitoring the Crankcase Ventilation Pressure sensor output voltage and failing the diagnostic when the Crankcase Ventilation Pressure voltage is too low. The Crankcase Ventilation Pressure sensor is a pressure transducer which outputs a voltage proportional to the gauge pressure between the crankcase ventilation hose and the atmosphere.	Crankcase Ventilation Pressure Sensor Voltage	<= 4.3% of 5 Volt Range (This is equal to -5.71 kPa)	Diagnostic is Enabled		1,280 failures out of 1,600 samples 1 sample every 3.125 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankcase Ventilation Hose Connection Sensor Circuit High	P04E3	Detects a continuous short to power in the Crankcase Ventilation Pressure signal circuit by monitoring the Crankcase Ventilation Pressure sensor output voltage and failing the diagnostic when the Crankcase Ventilation Pressure voltage is too high. The Crankcase Ventilation Pressure sensor is a pressure transducer which outputs a voltage proportional to the gauge pressure between the crankcase ventilation hose and the atmosphere.	Crankcase Ventilation Pressure Sensor Voltage	>= 95.5 % of 5 Volt Range (This is equal to 5.69 kPa)	Diagnostic is Enabled		1,280 failures out of 1,600 samples 1 sample every 3.125 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankcase Ventilation Hose Connection Sensor Range/ Performance	P04FB	Detects a performance failure in the Crankcase Ventilation Pressure sensor, such as when the sensor value is stuck in range. If the engine has been off for a sufficient amount of time, the pressure in the crankcase ventilation system will equalize to atmospheric pressure. The Crankcase Ventilation Pressure sensor value is checked to see if it is within the normal expected range around the expected value of 0 kPa. If it is not, the Crankcase Ventilation Pressure performance diagnostic will fail. The Crankcase Ventilation Pressure sensor is a pressure transducer which outputs a voltage proportional to the gauge pressure between the crankcase ventilation hose and the atmosphere.	Crankcase Ventilation Pressure OR Crankcase Ventilation Pressure	>= 0.63 kPa <= -0.63 kPa	Diagnostic is Enabled Engine is not rotating (Time since engine has stopped rotating OR Outside Ambient Temperature) Engine Coolant Temperature <u>DTCs Active:</u>	**P04FB : Pressure Sensor Equilibrium >= Time** seconds >= -9.00 deg C >= 60.0 deg C PCV_Sensor_Circuit_FA ECT_Sensor_FA EngineModeNotRunTimerError	128 failures out of 160 samples 1 sample every 3.125 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Low Engine Speed Idle System	P0506	This DTC indicates that actual engine speed is lower than desired engine speed at idle so that it is out of speed control capability. Testing is performed when basic conditions are met. If filtered engine speed error exceeds a calibrated threshold for a calibrated duration, code is set. This testing is performed continuously per trip if basic conditions are met	Filtered Engine Speed Error. It is calculated with a calibrated filter coefficient Filter coefficient	> 95.00 rpm 0.00375	Baro Coolant Temp Engine run time Ignition voltage Time since gear change Time since a TCC mode change IAT Vehicle speed Commanded RPM delta Idle time For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 70 kPa > 60 °C > 60 sec 32 > volts > 11 > 3 sec > 3 sec > -20 °C < 1.24 mph, 2kph < 25 rpm > 10 sec > 5.00 pct < 5.00 pct PTC not active Transfer Case not in 4WD LowState	Diagnostic runs in every 12.5 ms loop Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No active DTCs	Off-vehicle device control (service bay control) must not be active. following conditions not TRUE: (VeTESR_e_EngSpdReqlntvType = CeTESR_e_EngSpdMinLimitAND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) Clutch is not depressed TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit.FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFault LowFuelConditionDiagnostic Clutch Sensor FA AmbPresDfltdStatus		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					All of the above met for Idle time	P2771 > 10 sec The diagnostic does not run during autostop as engine is shutdown during that time (occurs in a hybrid or 12v start stop vehicle)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
High Engine Speed Idle System	P0507	This DTC indicates that actual engine speed is higher than desired engine speed at idle so that it is out of speed control capability. Testing is performed when basic conditions are met. If filtered engine speed error exceeds a calibrated threshold for a calibrated duration, code is set. This testing is performed continuously per trip if basic conditions are met	Filtered Engine Speed Error. It is calculated with a calibrated filter coefficient Filter coefficient	< -190.00 rpm 0.00375	Baro Coolant Temp Engine run time Ignition voltage Time since gear change Time since a TCC mode change IAT Vehicle speed Commanded RPM delta For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 70 kPa > 60 °C > 60 sec 32 > volts > 11 > 3 sec > 3 sec > -20 °C < 1.24 mph, 2kph < 25 rpm > 5.00 pct < 5.00 pct PTC not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active.	Diagnostic runs in every 12.5 ms loop Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						following conditions not TRUE: (VeTESR_e_EngSpdReqlntvType = CeTESR_e_EngSpdMinLimitAND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) Clutch is not depressed		
					No active DTCs	TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit.FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFaultLow FuelConditionDiagnostic Clutch SensorFA AmbPresDfltdStatus P2771		
					All of the above met	> 10 sec		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					for Idle time	The diagnostic does not run during autostop as engine is shutdown during that time (occurs in a hybrid or 12v start stop vehicle)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Rough Idle	P050D	Monitors the combustion performance when the cold start emission reduction strategy is active by accumulating and determining the percentage of engine cycles that have less than complete combustion relative to the total number of engine cycles in which Dual Pulse is active.	Deceleration index vs. Engine Speed Vs Engine load Deceleration index calculation is tailored to specific vehicle. Tables used are 1st tables encountered that are not max of range. Undetectable region at a given speed/load point is where all tables are max of range point. Incomplete combustion identified by P0300 threshold tables:	(>Idle SCDAND >Idle SCD ddt Tables) OR (>Idle Cyl Mode AND > Idle Cyl Mode ddt Tables)	Misfire Algorithm Enabled (Refer to P0300 for Enablement Requirements) OBD Manufacturer Enable Counter To enable the diagnostic, the Cold Start Emission Reduction Strategy Must Be Active per the following: Catalyst Temperature AND Engine Coolant AND Engine Coolant AND Barometric Pressure AND NumCLOEvents In addition, Dual Pulse Strategy Is Enabled and Active Per the following: Engine Speed Accel Position Engine Run Time For the engine speeds and loads in which Dual	= 0 < 500.00 degC > -12.00degC <= 66.00 degC >= 72.00 KPa < 1.00 >= 300.00 RPM <= 2,600.00 RPM <= 30.00 Pct < 36 seconds	Runs once per trip when the cold start emission reduction strategy is active and Dual Pulse is enabled and active. Frequency: 100ms Test completes after Dual Pulse is no longer active OR The first 500 engine cycles have been reached	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Pulse is active:			
					Dual Pulse Error induced misfires percentage	>= catalyst damaging misfire		
					Dual Pulse Error induced misfires percentage	< 90% of the maximum achieveable catalyst damaging misfire.		
					Engine Cycles	>= 75.00 <501		
					The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:			
					Catalyst Temperature AND Engine Run Time	>= 800.00 degC >= 0.00 seconds		
					OR			
					Engine Run Time	> **P050D_P1400_CatalystLightOffExtendedEngineRunTimeExit** This Extended Engine run time exit table is a function of percent ethanol and Catmons NormRatioEWMA. Refer to "Supporting Tables" for details.		
					OR			
					Barometric Pressure	< 72.00 KPa		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Dual Pulse Strategy will exit per the following:			
					Engine Speed	> 3,500.00 RPM		
					OR			
					Accel Position	> 60.00 Pct		
					Engine Run Time	>= 36 seconds		
					Dual Pulse Strategy will also exit if the any of the "Additional Dual Pulse Enabling Criteria" is not satisfied:			
					"Additional Dual Pulse Enabling Criteria":			
					Green Engine Enrichment	Not Enabled		
					Misfire Converter Protection strategy	Not being requested		
					Engine Metal Overtemp strategy	Not being requested		
					Fuel control state	Open Loop		
					Output State Control	Not being requested for fuel		
					DOD Or DFCO	Not Active		
					Power Enrichment	Not Active		
					Dynamic Power Enrichment	Not Active		
					Piston Protection	Not Active		
					Hot Coolant Enrichment	Not Active		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Injector Flow Test General Enable DTC's Not Set:	Not Active EngineMisfireDetected_FA AcceleratorPedalFailure ECT_Sensor_FA IAT_SensorCircuitFA MnfdTempSensorCktFA CrankSensor_FA FuelInjectorCircuit_FA MAF_SensorFA MAP_SensorFA AnyCamPhaser_TFTKO ClutchPstnSnsr FA IAC_SystemRPM_FA IgnitionOutputDriver_FA TPS_FA VehicleSpeedSensor_FA FuelInjectorCircuit_TFTK0 FHPR_b_FRP_SnsrCkt_FA FHPR_b_FRP_SnsrCkt_TFTKO FHPR_b_PumpCkt_FA FHPR_b_PumpCkt_TFTK0 TransmissionEngagedState_FA EngineTorqueEstInaccurate FuelPumpRlyCktFA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Pressure (EOP) Sensor Performance - Continuously Variable Displacement Oil Pump	P0521	Determines if the Engine Oil Pressure (EOP) Sensor is stuck or biased in range. The engine oil pressure is compared against thresholds when engine is running and when engine is off.The engine oil pressure rationality diagnostic has two parts: engine running test and engine off test. The engine running test compares the measured oil pressure to threshold. If the measured oil pressure is out of the thresholds, then the error counter increments. The engine off test compares the measured oil pressure against thresholds after the engine has stopped rotating. If the measured oil pressure is out of the thresholds, then the error counter increments.	<u>To Fail when previously passing with the engine running:</u> Filtered Engine Oil Pressure below threshold OR Filtered Engine Oil Pressure above threshold <u>To pass when previously failing:</u> Filtered Engine Oil Pressure above low threshold plus an offset OR Filtered Engine Oil Pressure below high threshold minus an offset	Filtered Oil Pressure < (**P0521_CVDOP_MinOilPresFail** kPa) OR Filtered Oil Pressure > (**P0521_CVDOP_MaxOilPressure** kPa) Filtered Oil Pressure > (**P0521_CVDOP_MinOilPresFail** + 10.0 kPa) OR Filtered Oil Pressure < (**P0521_CVDOP_MaxOilPressure** - 10.0 kPa)	Variable Displacement Oil Pump is Present = TRUE Engine Running Diagnostic Status Engine Off Rationality Test Diagnostic Reporting Status Oil Pressure Sensor In Use Engine Running Ambient Air Pressure Oil Aeration (= TRUE if engine speed > 4,500 RPM for longer than **TimeForOilAeration** seconds) Filtered Engine Speed within range Sensed Oil Temperature within range Engine Speed stable No active DTC's	Enabled Enabled Test not report a fail state Yes >10.0 seconds >70.0 kPa FALSE 1,000 RPM < Filtered Engine Speed < 4,500 RPM 40.0 deg C < Sensed Oil Temperature <120.0 degC (RPM - Previous RPM) < 35 Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA CrankSensor_FA	> 40 errors out of 50 samples. Performed every 100 msec > 10passes out of 50 samples. Performed every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Two Stage Oil Pump EOP Sensor Test with Engine Off If enabled: <u>To Fail when previously passing with the engine off:</u> Difference between oil pressure and Barometric pressure is Greater than a threshold OR Less than a threshold	 (Oil Pressure - Barometric Pressure) >-30.0 kPa OR <30.0 kPa	Two Stage Oil Pump is Present = TRUE Engine Off Rationality Test Diagnostic Status Engine Running Rationality Test Diagnostic Status Modelled Oil Temperature No Engine Movement No active DTC's	Enabled Enabled Test not report a fail state > 0.0 deg C > 10.0 seconds EngineModeNotRunTimer_FA EngOilTempFA EngOilPressureSensorCktFA CrankSensor_FA	> 20 errors out of 40 samples. Run once per trip	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Pressure (EOP) Sensor Circuit Low Voltage	P0522	Determines if the Engine Oil Pressure (EOP) Sensor circuit voltage is too low. This diagnostic compares the EOP circuit voltage to the reference voltage.	(Engine Oil Pressure Sensor Circuit Voltage) - 5 Volts) *100	< 10.00 percent Deadband: < 5 percent or > 95 percent	Engine Speed Enable Engine Speed Disable Oil Pressure Sensor In Use Diagnostic Status	> 400 rpm < 350 rpm Yes Enabled	1,280 failures out of 1,600 samples Performed every 3.125 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Pressure (EOP) Sensor Circuit High Voltage	P0523	Determines if the Engine Oil Pressure (EOP) Sensor circuit voltage is too high. This diagnostic compares the EOP circuit voltage to the reference voltage.	(Engine Oil Pressure Sensor Circuit Voltage) - 5 Volts) *100	> 90.00 percent Deadband: < 5 percent or > 95 percent	Oil Pressure Sensor In Use Diagnostic Status	Yes Enabled	1,280 failures out of 1,600 samples Performed every 3.125 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
System Voltage Low	P0562	Detects a low 12V battery system. This diagnostic reports the DTC when battery voltage is low. Monitoring occurs when the engine speed is above a calibrated value.	System voltage low	Battery voltage <= 9.00	System voltage low diag enable = TRUE Enable Starter motor criteria met (Starter motor not engaged) Enable engine speed criteria met (Engine speed higher than) Enable run crank criteria met	1.00 1.00 1.00 >=400.00 1.00	400 failures out of 500 samples 12.5 ms /sample	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
System Voltage High	P0563	Detects a high 12V battery system. This diagnostic reports the DTC when battery voltage is high.	System voltage high	Battery voltage >= 18.00	System voltage high diag enable = TRUE Enable run crank criteria met	1.00 1.00	400 failures out of 500 samples 12.5 ms /sample	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Mutil-Functon Switch Circuit Switch Bank 1	P0564	Detect when cruise control multi-function switch circuit (analog) voltage is in an invalid range. "When the BCM tells the ECM that the cruise control analog input voltage is in an invalid range, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	Cruise Control analog circuit voltage must be "between ranges" for greater than a calibratable period of time over a sample period.	The cruise control analog voltage A/D count ratio is considerred to be "between ranges" when the ratio is measured in the following ranges: 0.28 -0.31, 0.415-0.445, 0.585-0.615 0.78-0.81, 1.005- 1.035	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	indicate failure for 0.50 seconds over the sample period / 25.00 seconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control On Switch Circuit Switch Bank 1 or 2	P0565	Detects a failure of the cruise on/off switch in a continously applied state "When the BCM tells the ECM that the cruise control analog input voltage is in the Momentary Cruise On/ Off range for too long, the code is set and cruise control is disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails." Only applicable for vehicles with a momentary on/off cruise switch architecture.	Cruise Control On switch remains applied for greater than a calibratable period of time over a sample period.	fail in the applied state for greater than 20.00 seconds over the sample period of 25.00 seconds	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	fail for greater than 20.00 seconds/ 25.00 seconds	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Resume Circuit Switch Bank 1 or 2	P0567	Detects a failure of the cruise resume switch in a continously applied state "When the BCM tells the ECM that the cruise control analog input voltage is in the Resume range for too long, the code is set and cruise control is disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	Cruise Control Resume switch remains applied for greater than a calibratable period of time over a sample period.	fail in the applied state for greater than 89.00 seconds over the sample period of 99.00 seconds	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	fail for greater than 89.00 seconds/ 99.00 seconds	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Set Circuit Switch Bank 1 or 2	P0568	Detects a failure of the cruise set switch in a continously applied state "When the BCM tells the ECM that the cruise control analog input voltage is in the Set range for too long, the code is set and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	Cruise Control Set switch remains applied for greater than a calibratable period of time over a sample period	fail in the applied state for greater than 89.00 seconds over the sample period of 99.00 seconds	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	fail for greater than 89.00 seconds/ 99.00 seconds	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Cancel Switch Circuit Switch Bank 1 or 2	P056C	Detects a failure of the cruise cancel switch in a continously applied state "When the BCM tells the ECM that the cruise control analog input voltage is in the Cancel range for too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails." Only applicable for vehicles with a momentary on/off cruise switch architecture.	Cruise Control Cancel switch remains applied for greater than a calibratable period of time over a sample period	fail in the applied state for greater than 20.00 seconds over the sample period of 25.00 seconds	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	fail for greater than 20.00 seconds/ 25.00 seconds	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Brake Pedal Position Sensor Circuit Range/ Performance	P057B	This diagnostic monitors the Brake Pedal Position Sensor for a stuck in range failure	Brake pedal position sensor movement diagnostic cal is enabled 1.00	True	Diagnostic is enabled. Brake Pedal Position Sensor Circuit Range / Performance Diagnostic Enable	1.00 ignition voltage > 10.00		MIL: Type A, 1 Trips
			Calculated EWMA value must be greater than calibratable theshold after calibratable number of tests have completed to report a "test passed" for P057B	EWMA value looked up in supporting table **P057B KtBRKI_K_FastTestPointWeight** P057B as a function of calculated brake pedal position delta EWMA value is > 0.80	calculated brake pedal position delta sample counter > 50.00 for fast test OR calculated brake pedal position delta sample counter > 1,000.00 for slow test	calculated brake pedal position delta > 3.64 OR (for slow test) shift lever has been in park once this key cycle vehicle speed >= 6.00 accelerator pedal position < 5.00	total number of EWMA tests > 20.00	
			Calculated EWMA Value must be less than calibratable threshold after calibratable number of tests have completed to report a "test failed" for P057B. This test runs once per key cycle	EWMA value looked up in supporting table **P057B KtBRKI_K_CmpltTest Pointweight** P057B as a function of calculated brake pedal position delta EWMA value is less thatn 0.40	no DTC's active (P057C, P057D)	shift lever has been in park once this key cycle vehicle speed >= 6.00 accelerator pedal position < 5.00	total number of EWMA tests > 2.00	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Brake Pedal Position Sensor Circuit Low	P057C	detects short to ground for brake pedal position sensor	If x of y samples are observed below failure threshold, default brake pedal position to zero percent and set DTC.	5.00	Diagnostic is enabled. Brake Pedal Position Sensor Low Voltage Diagnostic Enable	1.00	20.00 / 32.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Brake Pedal Position Sensor Circuit High	P057D	detects open circuit for brake pedal position sensor	If x of y samples are observed above failure threshold, default brake pedal position to zero percent and set DTC	95.00	Diagnostic is enabled. Brake Pedal Position Sensore High Voltage Diagnostic Enable	1.00	20.00/ 32.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Brake Pedal Position Sensor Circuit Intermittent/ Erratic	P057E	detects noisy / erratic ouput for brake pedal position sensor	If x of y samples are observed above failure threshold, default brake pedal position to zero percent and set DTC	30.29	Diagnostic is enabled. Brake Pedal Position Sensor Circuit Intermittent / Erratic Diagnostic Enable	1.00	5.00/ 20.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Multi-function Circuit Low Voltage Bank 1	P0580	detects short to ground failure for cruise control multi-function switch circuit (analog) voltage When the BCM tells the ECM that the cruise control analog input voltage is too low for too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails." Only applicable for vehicles with a momentary on/off cruise switch architecture. For certain vehicles (GM Global A), this also accounts for Open Circuit failure on cruise multi-function switch circuit.	Cruise Control analog circuit voltage must be in an "Short To Ground" range for greater than a calibratable period of time over a sample period.	The cruise control analog voltage A/D count ratio is considerred to be "short to ground when the ratio is measured in the following rangs: 0-0.185	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	indicate failure for 2.00 seconds / 25.00 seconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Multi-function Circuit High Voltage Bank 1	P0581	detects short to power failure for cruise control multi-function switch circuit (analog) voltage When the BCM tells the ECM that the cruise control analog input voltage is too high for too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails." Only applicable for vehicles with a momentary on/off cruise switch architecture.	Cruise Control analog circuit voltage must be in an "Open Short To Ground" range for greater than a calibratable period of time over a sample period.	The cruise control analog voltage A/D count ratio is considered to be "short to power" when the ratio is measured in the following range: 1.005- 1.035	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	indicate failure for 2.00 seconds / 25.00 seconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Multi-Function Input B Circuit Bank 2	P0589	Detect when cruise control multi-function switch circuit B (analog) voltage is in an invalid range When the BCM tells the ECM that the cruise control analog input voltage is detected Out of Range for too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	Cruise Control analog circuit B voltage must be "between ranges" for greater than a calibratable period of time over a sample period..	The cruise control analog voltage A/D count ratio is considerred to be "between ranges" when the ratio is measured in the following ranges: 0.28 -0.31, 0.415-0.445, 0.585-0.615, 0.78-0.81	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	indicate failure for 0.50 seconds / 25.00 seconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Multi-Function Input B Circuit Low Bank 2	P0592	detects short to ground failure for cruise control multi-function switch circuit B (analog) voltage. When the BCM tells the ECM that the cruise control analog input voltage is detected too lowfor too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	Cruise Control analog circuit B voltage must be in an "Open Short To Ground" range for greater than a calibratable period of time over a sample period.	The cruise control Circuit B analog voltage A/D count ratio is considered to be "open short to groun"d when the ratio is measured in the following rangs: 0-0.185	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	indicate failure for 2.00 seconds / 25.00 seconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Multi-Function Input B Circuit High Bank 2	P0593	detects short to power failure for cruise control multi-function switch circuit B (analog) voltage. When the BCM tells the ECM that the cruise control analog input voltage is detected too high for too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	Cruise Control analog circuit B voltage must be in a "Short To Power" range for greater than a calibratable period of time over a sample period.	The cruise control Circuit B analog voltage A/D count ratio is considered to be "short to power" when the ratio is measured in the following range: 1.005- 1.035	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	indicate failure for 2.00 seconds/ 25.00 seconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Active Grill Air Shutter A Performance /Stuck OFF	P059F	A2-part diagnostic. Part 1 continuously monitors for failure to achieve a commanded shutter actuator position [Suspect Stuck Condtion] when X failures occur in Y samples after an electronic command latency delay. A Part 1 failure result then enables Part 2 which makes a fixed number of repeat attempts to reach the commanded postion [ReTry to clear obstruction]. The DTC is set when the calibrated fault threshold count of repeat attempts is reached without achieving the original commanded shutter position. Retry attempts will continue until the commanded position is achieved or the trip ends.	[Smart Shutter Actuator 1 Position Response **OR** Shutters Not Initialized **OR** The absolute difference between Smart Shutter Actuator 1 Position Response and Shutter response and Commanded Position percent] **AND** Shutter 1 Diagnostic Delay Threshold count	[Indeterminate **OR** = TRUE **OR** > 5.00] **AND** Counter > 109.00 counts	a. Command Shutterl Enable. b. Shutterl Performance Diagnostic Enabled c. Off Vehicle Communication Service Request Diagnostic Enabled Any of the following conditions are met: d. Run Crank Active All of the following conditions are met: e. Run Crank Active f. Command On and Key Off g. ECU Awake h. Run Crank Voltage in Range i. Ignition Powertrain Relay Voltage in Range j. Actuator Initialization Complete Any of the following conditions are met k. If Enabled, performance diagnostics will be enabled even in the	a. = TRUE b. = Enabled c. = TRUE d. =TRUE e. = FALSE f. =TRUE g. =TRUE h. >=11.00 AND <= 32.00 i. >= 11.00 AND <= 32.00 j. =TRUE k. = Disabled	0.1 seconds out of a 0.1 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					presence of a communication fault. All of the following conditions are met: l. LIN communication NOT faulted.(DTC: U028400, U058500) m. No LIN communication Fault Pending n. LIN communication Data is Ready	 l. = TRUE m. =TRUE n. =TRUE		
			Shutter 1 Performance Test count	= 5.00 counts	a. Command Shutterl Enable. b. Shutterl Performance Diagnostic Enabled c. Off Vehicle Communication Service Request Diagnostic Enabled Any of the following conditions are met: d. Run Crank Active All of the following conditions are met: e. Run Crank Active f. Command On and Key Off	a. = TRUE b. = Enabled c. = TRUE d. =TRUE e. = FALSE f. =TRUE	1-5 actuator cycles [1 cycle typically requires 10-25 seconds]	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					g. ECU Awake	g. = TRUE		
					h. Run Crank Voltage in Range	h. >=11.00 AND <= 32.00		
					i. Ignition Powertrain Relay Voltage in Range	i. >= 11.00 AND <=32.00		
					j. Actuator Initialization Complete	j. =TRUE		
					Any of the following conditions are met			
					k. If Enabled, performance diagnostics will be enabled even in the presence of a communication fault.	k. = Disabled		
					All of the following conditions are met:			
					l. LIN communication NOT faulted.(DTC: U028400, U058500)	l. = TRUE		
					m. No LIN communication Fault Pending	m. =TRUE		
					n. LIN communication Data is Ready	n. =TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Active Grill Air Shutter B Performance /Stuck OFF	P05AE	A2-part diagnostic. Part 1 continuously monitors for failure to achieve a commanded shutter actuator position [Suspect Stuck Condtion] when X failures occur in Y samples after an electronic command latency delay. A Part 1 failure result then enables Part 2 which makes a fixed number of repeat attempts to reach the commanded postion [ReTry to clear obstruction]. The DTC is set when the calibrated fault threshold count of repeat attempts is reached without achieving the original commanded shutter position. Retry attempts will continue until the commanded position is achieved or the trip ends. Retry attempts will continue until the commanded position is achieved or the trip ends.	[Smart Shutter Actuator 2 Position Response **OR** Shutters Not Initialized **OR** The absolute difference between Smart Shutter Actuator 2 Position Response and Shutter response and Commanded Position percent] **AND** Shutter 2 Diagnostic Delay Threshold count	[Indeterminate **OR** = TRUE **OR** >5.00] **AND** Counter > 109.00 counts	a. Command Shutter2 Enable. b. Shutter2 Performance Diagnostic Enabled c. Off Vehicle Communication Service Request Diagnostic Enabled Any of the following conditions are met: d. Run Crank Active All of the following conditions are met: e. Run Crank Active f. Command On and Key Off g. ECU Awake h. Run Crank Voltage in Range i. Ignition Powertrain Relay Voltage in Range j. Actuator Initialization Complete Any of the following conditions are met k. If Enabled, performance diagnostics will be	a. = TRUE b. = Enabled c. = TRUE d. = TRUE e. = FALSE f. = TRUE g. = TRUE h. >=11.00 AND <= 32.00 i. >= 11.00 AND <=32.00 j. =TRUE k. = Disabled	0.1 seconds out of a 0.1 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					enabled even in the presence of a communication fault. All of the following conditions are met: l. LIN communication NOT faulted.(DTC: U028500, U058600) m. No LIN communication Fault Pending n. LIN communication Data is Ready	 l. = TRUE m. =TRUE n. =TRUE		
			Shutter 2 Performance Test count	= 5.00 counts	a. Command Shutter2 Enable. b. Shutter2 Performance Diagnostic Enabled c. Off Vehicle Communication Service Request Diagnostic Enabled Any of the following conditions are met: d. Run Crank Active All of the following conditions are met: e. Run Crank Active f. Command On and Key Off	a. = TRUE b. = Enabled c. = TRUE d. =TRUE e. = FALSE f. =TRUE	1-5 actuator cycles [1 cycle typically requires 10-25 seconds]	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					g. ECU Awake	g. = TRUE		
					h. Run Crank Voltage in Range	h. >=11.00 AND <= 32.00		
					i. Ignition Powertrain Relay Voltage in Range	i. >= 11.00 AND <=32.00		
					j. Actuator Initialization Complete	j. =TRUE		
					Any of the following conditions are met			
					k. If Enabled, performance diagnostics will be enabled even in the presence of a communication fault.	k. = Disabled		
					All of the following conditions are met:			
					l. LIN communication NOT faulted.(DTC: U028500, U058600)	l. = TRUE		
					m. No LIN communication Fault Pending	m. =TRUE		
					n. LIN communication Data is Ready	n. =TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intake Camshaft System Cold Start Performance - Bank 1	P05CC	Detects a VVT system error during Cold Starts by comparing the desired and actual cam positions when WT is activated. This is the same type diagnostic as P0011 except this detects excessive deviations of position while the cold start phaser positions are being commanded.	Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive	Cam Position Error > 6.00 deg.	Diagnositc is Enabled **Intake Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active **Catalyst Warmup Enabled** Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	 '=TRUE > 11.00 Volts = TRUE = FALSE = TRUE > 0 deg > 6.00 deg AND < 44.00 deg < 3.00 deg for (**P0011_P05CC_StablePositionTimeld**) seconds P0010 P2088 P2089	65 failures out of 75 samples 100 ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if the calibration check sum is incorrect or the flash memory detects an uncorrectable error via the Error Correcting Code.	The Primary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1 failure if the fault is detected during the first pass. 5.00 failures if the fault occurs after the first pass is complete.			Diagnostic runs continuously in the background.	Type A, 1 Trips
			The Primary Processor's Error Correcting Code hardware in the flash memory detects an error. Covers all software and calibrations.	254 failures detected via Error Correcting Code			Diagnostic runs continuously via the flash hardware.	
				In all cases, the failure count is cleared when controller shuts down				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Not Programmed	P0602	This DTC will be stored if the ECU is a service part that has not been programmed.	Service (reflash) controller calibration present	= 1		none	Diagnostic runs at powerup and once per second continuously after that	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
ECM Long Term Memory Reset	P0603	This DTC detects an invalid NVM which includes a Static NVM, Perserved NVM, ECC ROM in NVM Flash Region, and Perserved NVM during shut down.	Static NVM region error detected during initialization				Diagnostic runs at controller power up.	Type A, 1 Trips
			Perserved NVM region error detected during initialization				Diagnostic runs at controller power up.	
			Perserved NVM region error detected during shut down.				Diagnostic runs at controller power down.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
ECM RAM Failure	P0604	Indicates that the ECM has detected a RAM fault. This includes Primary Processor System RAM Fault, Primary Processor Cache RAM Fault, Primary Processor TPU RAM Fault, Primary Processor Update Dual Store RAM Fault, Primary Processor Write Protected RAM Fault, and Secondary Processor RAM Fault. This diagnostic runs continuously.	Indicates that the primary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	Type A, 1 Trips
			Indicates that the primary processor is unable to correctly read data from or write data to cached RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor is unable to correctly read data from or write data to TPU RAM. Detects data read does not match data written >=	5 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor detects an illegal write attempt to protected RAM. Number of illegal writes are >	65,534 counts			Diagnostic runs continuously (background loop)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal ECM Processor Integrity Fault	P0606	Indicates that the ECM has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for both the primary and secondary processsors.	Time new seed not received exceeded			always running	450 milliseconds	Type A, 1 Trips
			MAIN processor receives seed in wrong order			always running	3 / 18 counts intermittent. 50 ms/count in the ECM main processor	
			2 fails in a row in the MAIN processor's ALU check			Test is Enabled: 0 (If 0, this test is disabled)	25 ms	
			2 fails in a row in the MAIN processor's configuration register masks versus known good data			Test is Enabled: 1 (If 0, this test is disabled)	12.5 to 25 ms	
			Checks number of stack over/under flow since last powerup reset >=	3.00		Test is Enabled: 1 (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			Voltage deviation >	0.4950		Test is Enabled: 1 (If 0, this test is disabled)	5 / 10 counts or 150 milliseconds continuous; 50 ms/count in the ECM main processor	
			MAIN processor DMA transfer from Flash to RAM has 1 failure			Test is Enabled: 0 (If 0, this test is disabled)	variable, depends on length of time to write flash to RAM	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Safety critical software is not executed in proper order.	>= 1 incorrect sequence.		Test is Enabled: **P0606 PFM_Enable f (Loop Time)** (If 0, this test is disabled)	Fail Table, f(Loop Time). See supporting tables: **P0606 PFM Sequence Fail f (Loop Time)** / Sample Table, f (Loop Time)See supporting tables: **P0606 PFM Sequence Sample f(Loop Time)** counts 50 ms/count in the ECM main processor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal ECM Processor Integrity Performance	P0607	Indicates that the ECM has detected an internal processor integrity performance.	Performs the failure diagnostic for the offline and online BIST results.			Test is enabled: 1 . (If 0, this test is disabled)	5 counts background task/ count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
ANDRADC Fault	P060B	Indicates that the ECM has detected an ANDR ADC Fault.	Resistance deviation percent >	6.00 %	Run/Crank Voltage >	7.00 V	2 / 14 counts or 1.75 seconds continuous; 250 ms/count in the ECM main processor	Type A, 1 Trips
			Resistance deviation percent >	6.00 %	Run/Crank Voltage >	7.00 V	2 / 14 counts or 1.75 seconds continuous; 250 ms/count in the ECM main processor	
			Resistance deviation percent >	6.00 %	Run/Crank Voltage >	7.00 V	2 / 14 counts or 1.75 seconds continuous; 250 ms/count in the ECM main processor	
			Resistance deviation percent >	6.00 %	Run/Crank Voltage >	7.00 V	2 / 14 counts or 1.75 seconds continuous; 250 ms/count in the ECM main processor	
			Resistance deviation percent >	6.00 %	Run/Crank Voltage >	7.00 V	2 / 14 counts or 1.75 seconds continuous; 250 ms/count in the ECM main processor	
			Resistance deviation percent >	6.00 %	Run/Crank Voltage >	7.00 V	2 / 14 counts or 1.75 seconds continuous; 250 ms/count in the ECM main processor	
			Resistance deviation	6.00 %	Run/Crank Voltage >	7.00 V	2 / 14 counts or	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			percent >				1.75 seconds continuous; 250 ms/count in the ECM main processor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Main Processor Performance (Gasoline applications ONLY)	P060C	Detect Processor Calculation faults due to RAM corruptions, ALU failures and ROM failures For all of the following cases: If the individual diagnostic threshold is equal to 2048 ms, this individual case is not applicable. If any of the following cases are X out of Y diagnostics and the fail (x) is greater than the sample (Y), this individual case is also not applicable.	Absolute difference between Equivance Ratio torque compensation and its dual store out of bounds given by threshold	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	Type A, 1 Trips
			Absolute difference of Accessory torque and its redundant calculation is out of bounds given by threshold range	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of Filtered Air-per-cylinder and its redundant calculation is out of bounds given by threshold range	99.84 mg	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference between the previous Final Advance and the	15.00 degrees		Engine speed >0rpm	Up/down timer 425 ms continuous,	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			current Final Advance not Adjusted for Equivalence Ratio is out of bounds given by threshold range				0.5 down time multipier	
			Torque Learn offset is out of bounds given by threshold range	High Threshold 0.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			One step ahead calculation of air-per-cylinder and two step ahead is greater than threshold	80.00 mg		Engine speed > 750 rpm	Up/down timer 448 ms continuous, 0.5 down time multipier	
			Difference between Unmanaged Spark and PACS Spark is greater than threshold	15.00 degrees	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded Predicted Engine Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Zero pedal axle torque is out of bounds given by threshold range	High Threshold 1,747.24 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Regen Axle Torque Rate Limit is out of bounds given by threshold	10,000.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference of Friction torque and its redundant calculation is out of bounds given by threshold range	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Arbitrated Air-Per-Cylinder filter coefficient is out of bounds given by throohold	High Threshold 4t000	Ignition State	Accessory, run or crank	Up/down timer 475 mo oontinuouo,	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			range	Low Threshold 0.074			0.5 down time multipier	
			Launch spark is active but the launch spark redundant path indicates it should not be active	N/A		Engine speed < 7,000.00 or 7,200.00 rpm (hysteresis pair)	Up/down timer 148 ms continuous, 0.5 down time multipier	
			Rate limited vehicle speed and its dual store do not equal	N/A		Time since first CAN message with vehicle speed >= 0.400 sec	10/40 counts; 25.0msec/count	
			Commanded engine torque due to fast actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multioier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Commanded engine torque due to slow actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			TOS to wheel speed conversion factor is out of bounds given by threshold range	High Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo Low Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo	Ignition State	Accessory, run or crank	255/6 counts; 25.0msec/count	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Cylinders active greater than commanded	2 cylinders		Engine run flag = TRUE > 2.00 s Number of cylinder events since engine run > 24 No fuel injector faults active	Up/down timer 448 ms continuous, 0.5 down time multipier	
			Driver progression mode and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Predicted torque for uncorrected zero pedal determination is greater than calculated limit.	Table, f(Engine, Oil Temp). **P060C_Speed Control External Load f(Oil Temp, RPM) +** 107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Engine Predicted Request Without Motor is greater than its redundant calculation plus threshold	106.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Engine Immediate Request Without Motor is greater than its redundant calculation plus threshold	106.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Positive Torque Offset is greater than its redundant calculation plus threshold OR	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Positive Torque Offset is less than its redundant calculation minus threshold					
			Total Axle Torque Constraint is greater than	-500.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, down time multipier0.5	
			Total Axle Torque Constraint is less than	500.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, down time multipier0.5	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Commanded Hybrid Predicted Crankshaft Request is greater than its redundant calculation plus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Commanded Hybrid Immediate Crankshaft Request is less than its redundant calculation minus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Regeneration Brake Assist is not within a	Brake Regen Assist < 0 Nm or	Ignition State	Accessory, run or crank	Up/down timer 2.048	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			specified range	Brake Regen Assist > 0.00 Nm			ms continuous, 0.5 down time multipier	
			Cylinder Spark Delta Correction exceeds the absolute difference as compared to Unadjusted Cylinder Spark Delta	15.00 degrees	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			1. Cylinder Torque Offset exceeds step size threshold OR 2. Sum of Cylinder Torque Offset exceeds sum threshold	1. 107.05 Nm 2. 107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Engine Capacity Minimum Immediate Without Motor is greater than its dual store plus threshold	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 89 ms continuous, 0.5 down time multipier	
			Engine Capacity Minimum Engine Off is greater than threshold	0 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Engine Capacity Minimum Engine Immediate Without Motor is greater than threshold	0 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
							multipier	
			Commanded Immediate Engine Request is greater than its redundant calculation plus threshold	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine Speed Lores Intake Firing (event based) calculation does not equal its redundant calculation	N/A		Engine speed greater than Orpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			Enoine Sneed Lores	N/A		Enoine soeed oreater	Uo/down timer	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Intake Firing timing (event based) calculation does not equal its redundant calculation			than Orpm	148 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque request exceeds calculated torque limit	Table, f(Oil Temp, RPM). See supporting tables: **P060C_Speed Control External Load f(Oil Temp, RPM) +** 107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	Table, f(Oil Temp, RPM). See supporting tables: **P060C_Speed Control External Load f(Oil Temp, RPM) +** 107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Difference between Driver Requested Immediate Torque primary path and its secondary exceeds threshold	1,747.24 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Driver Immediate Request is less than its redundant calculation minus threshold	1,747.24 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded Immediate Request is greater than its redundant calculation plus threshold OR Commanded Immediate Request is less than its redundant calculation	1,747.24 Nm 2,620.86 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			minus threshold					
			Primary Commanded Immediate Request is greater than its redundant calculation plus threshold OR Primary Commanded Immediate Request is less than its redundant calculation minus threshold	1,747.24 Nm 1,747.24 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded Immediate ~~Rooponoo Typo~~ io ~~oot to~~	N/A	Ignition State	Accessory, run or crank	Up/down timer ~~2£48~~	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Inactive				ms continuous, 0.5 down time multipier	
			Commanded Immediate Response Type is set to Inactive	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded Immediate Response Type is set to Inactive	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Difference between Cruise Axle Torque Arbitrated Request and Cruise Axle Torque Request exceeds threshold	65.52 Nm		Cruise has been engaged for more than 4.00 seconds	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Desired engine torque request greater than redundant calculation plus threshold	106.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Engine min capacity above threshold	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 108 ms continuous, 0.5 down time multipier	
			No fast unmanaged retarded spark above the applied spark plus the threshold	15.00 Degree		Engine speed greater than Orpm	Up/down timer 425 ms continuous, 0.5 down time multipier	
			Absolute difference of adjustment factor based on temperature and its dual store above threshold	2.76 m/s	Ignition State	Accessory, run or crank	Up/down timer 148 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			1. Absolute difference of redundant calculated engine speed above threshold	500 RPM		Engine speed greater than 0 RPM	Up/down timer 148 ms continuous, 0.5 down time multipier	
			After throttle blade pressure and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Speed Control's Preditcted Torque Request and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Engine oil temperature and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 348 ms continuous, 0.5 down time multipier	
			Desired throttle position greater than redundant calculation plus threshold	10.00 percent	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of the rate limited pre-throttle pressure and its redundant calculation greater than threshold	0.06 kpa	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Throttle desired torque above desired torque plus threshold	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Difference of Final Torque feedback proportional plus integral term and its redundant calculation is out of bounds given by threshold range	High Threshold 107.05 Nm Low Threshold -107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of torque model coefficients and its redundant calculation is out of bounds given by threshold range	High Threshold 0.0000418 Low Threshold -0.0000418	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Difference of base friction torque and its redundant calculation is out of bounds given by threshold	High Threshold 107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			range	Low Threshold -107.05 Nm			down time multipier	
			Accessory drive friction torque is out of bounds given by threshold range	High Threshold 107.05 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			AC friction torque is greater than commanded by AC control software or less than threshold limit	High Threshold 35.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Difference of Oil temperature delta friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 107.05 Nm Low Threshold -107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Generator friction torque is out of bounds given by threshold range	High Threshold 107.05 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference	107.05	Ionition State	Accessory, run or crank	Up/down timer	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			between the Supercharger friction torque and its redundant calculation greater than threshold	Nm			475 ms continuous, 0.5 down time multipier	
			Filtered Torque error magnitude or its increase rate of change is out of allowable range or its dual store copy do not match	High Threshold 107.05 Nm Low Threshold -107.05 Nm Rate of change threshold 6.69 Nm/loop		Engine speed >0rpm MAF, MAP and Baro DTCs are false	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque error compensation is out of bounds given by threshold range	High Threshold 107.05 Nm Low Threshold -OtOO----------	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				Nm				
			Delta Torque Baro compensation is out of bounds given by threshold range	High Threshold 14.37 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			1. Difference of reserve torque value and its redundant calculation exceed threshold OR 2. Reserve request does not agree with operating conditions or Difference of final predicted torque and its redundant calculation exeed threshold OR	1.106.05 Nm 2. N/A 3.106.05 Nm 4.106.05 Nm	3. &4.: Ignition State	1. &2.: Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 107.05 Nm 3. &1.:	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			3. Rate of change of reserve torque exceeds threshold, increasing direction only OR 4. Reserve engine torque above allowable capacity threshold			Accessory, run or crank		
			Engine Vacuum and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of the calculated Intake Manifold Pressure during engine event versus during time event is greater than threshold	Table, f(Desired Engine Torque). See supporting tables: **P060C_Delta MAP Threshold f(Desired Engine Torque)**		Engine speed >0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			Min. Axle Torque Capacity is greater than threshold	0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multioier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Driver Predicted Request is greater than its redundant calculation plus threshold OR Driver Predicted Request is less than its redundant calculation minus threshold	1,747.24 Nm 2,620.86 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Total Driver Predicted Request is greater than its redundant calculation plus threshold OR Total Driver Predicted Request is less than its redundant calculation minus threshold	1,747.24 Nm 2,620.86 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Cold Delta Friction Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Predicted torque for zero pedal determination is greater than calculated limit.	Table, f(Oil Temp, RPM). See supporting tables: **Speed Control External Load f(Oil Temp, RPM) +** 107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded Predicted Axle Torque and its dual store do not match	1 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Steady State Estimated Engine Torque and its dual store are not equal	N/A		AFM not changing from Active to Inactive and preload torque not changing and one loop after React command Engine speed >0rpm	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Difference of Weighting factor for number of cylinders fueled and its redundant calculation is above threshold	0.26		Engine run flag = TRUE > 10.00 s	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Difference of minimum spark advance limit and its redundant calculation is out of bounds given by threshold range	15.00 degrees	Ignition State	Accessory, run or crank	Up/down timer 148 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Difference of commanded spark advance and adjusted delivered is out of bounds given by threshold range	15.00 degrees		Engine speed >0rpm	Up/down timer 425 ms continuous, 0.5 down time multipier	
			Absolute difference between Estimated Engine Torque and its dual store are above a threshold	107.05 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference between Estimated Engine Torque without reductions due to torque control and its dual store are above a threshold	107.05 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of desired spark advance for managed torque and its redundant calculation is out of bounds given by threshold range	15.00 degrees		Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 107.05 -Nm ----------	Up/down timer 448 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Absolute difference of Engine Capacity Minimum Running Immediate Brake Torque Excluding Cylinder Sensitivity and its redundant calculation is out of bounds given by threshold range	107 Nm		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multipier	
			One step ahead calculation of air-per-cylinder greater than two step ahead calculation by threshold for time	Threshold: Dynamically calculated based on current engine conditions Fault Pending Threshold: 100 ms		Engine speed > 750 rpm	Up/down timer 448 ms continuous, 0.5 down time multipier	
			Rate limited cruise axle	65.52	Ionition State	Accessory, run or crank	Up/down timer	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			torque request and its dual store do not match within a threshold	Nm			163 ms continuous, 0.5 down time multipier	
			1. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range OR 2. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its dual store do not equal OR 3. Absolute difference of Calculated accelerator pedal position and its dual store do not equal	1. 3.50 % 2. N/A 3. N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			1. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range OR 2. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its dual store do not equal OR 3. Absolute difference of Calculated accelerator pedal position and its dual store do not equal	1. 3.50 % 2. N/A 3. N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Commanded axle torque is greater than its redundant calculation by threshold	1,747.24 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded axle torque is greater than its redundant calculation by threshold	1,747.24 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded axle torque is greater than its redundant calculation by threshold OR Commanded axle torque is less than its redundant calculation by threshold	1,747.24 Nm 2,620.86 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded axle torque is greater than its redundant calculation by threshold	1,747.24 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			OR Commanded axle torque is less than its redundant calculation by threshold	2,620.86 Nm			multipier	
			Commanded axle torque is greater than its redundant calculation by threshold OR Commanded axle torque is less than its redundant calculation by threshold OR Secondary Torque Fill is above Driver Intended Torque greater than a threshold	1,747.24 Nm 2,620.86 Nm 0.00 second	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded distribution axle torque is greater than its redundant calculation by threshold OR Commanded distribution axle torque is less than its	1,747.24 Nm 2,620.86 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			threshold					
			Secondary axle torque Request is not equal to its redundant calculation		Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded axle torque is less than its redundant calculation by threshold	2,620.86 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded axle torque is less than its redundant calculation by threshold	1,747.24 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Preload timer and its redundant calculation do not equal	N/A	Ignition State	Accessory, run or crank AFM apps only	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			AC friction torque is greater than commanded by AC control software	35.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine Speed Lores Intake Firing (time based) calculation does not equal its redundant calculation	N/A		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of the calculated spark offset for equivalence ratio and its redundant cacluation is greater than a threshold	15.00 degrees		Engine speed >0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			Transmission Torque Request cacluations do not equal their dual stores	N/A			16/32 counts; 25.0msec/count	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Absolute difference of the predicted motor torque ACS and its redundant cacluation is greater than a threshold	0.01 Nm			Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Absolute difference of maximum throttle area and its redundant cacluation is greater than a threshold	15 mm2			Up/down timer 148 ms continuous, 0.5 down time multipier	
			Pedal learns and their redundant calculation do not equal		Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Throttle learns and their redundant calculation do not equal		Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Desired Throttle Position and its redundant calculation do not equal		Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference between Estimated Engine Torque and Commanded Engine Tnmiip i.qnrpptpr than pn	107.05 Nm	Engine State	Running	Up/down timer 200.00 ms continuous, n 5	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			offset -OR- Difference between Engine Torque Control Feedback and its redundant feedback calculation are beyond its safety bounds -OR- Immediate Feedback Control is active beyond allowed -OR- Torque Control MPC Failure is active	 Greater than 107.05 Nm or Lower than 107.05 Nm 2.00 seconds			down time multipier	
			Calculated or Commanded Engine to Axle ratio is lower than a threshold -OR- Engine to Axle Offset is greater than a threshold	0.9 107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175.00 ms continuous, 0.5 down time multipier	
			Difference between Cruise Arbitration Request and its redundant calcultion exceeds a threshold -OR- Difference between Cruise Accleration	65.52 Nm 0.05 KPH/Second	Ignition State	Accessory, run or crank	Up/down timer 500.00 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			redundant calcultion exceeds a threshold					
			Difference between commanded Axle Torque and its redundant calcultion is greater than a threshold -OR- Difference between commanded Axle Torque and its redundant calcultion is less than a threshold	1,747.24 Nm 2,620.86 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,047.97 ms continuous, 0.5 down time multipier	
			Difference between the Capability Torque and it's redundant calculation is greater than this threshold	107.05	Ignition State	Accessory, run or crank	Up/down timer 107.50 ms continuous, 0.5 down time multipier	
			Difference between the Capacity Torque and it's redundant calculation is greater than this threshold	107.05	Ignition State	Accessory, run or crank	Up/down timer 175.00 ms continuous, 0.5 down time multipier	
			Idle Creep Axle Torque is greater than -AND- Vehicle Speed is greater than	182.49 Nm 50.00 kph	Ignition State Accelerator pedal	Accessory, run or crank not applied	Up/down timer 2,000.00 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Actual Axle Torque is greater than a threshold -AND- Vehicle Speed is greater than	Table, ((Vehicle Speed). See supporting tables: **P060C_RoadLoad f (Vehicle Speed)** 50.00 kph	Ignition State Accelerator pedal	Accessory, run or crank not applied	Up/down timer 2,000.00 ms continuous, 0.5 down time multipier	
			Actual Axle Torque is greater than a threshold -AND- Vehicle Speed is greater than	Table. ((Vehicle Speed).Table, ((Vehicle Speed). See supporting tables: **P060C_RoadLoad f (Vehicle Speed)** minus **P060C_DecelOffset f (VehicleSpeed)** Nm 50.00 kph	Ignition State Accelerator pedal Coastdown Error	Accessory, run or crank not applied not active	Up/down timer 2,000.00 ms continuous, 0.5 down time multipier	
			(Idle Creep Axle Torque is greater than -OR- Actual Axle Torque is greater than a threshold -OR- Actual Axle Toroue is	182.49 Nm Table, ((Vehicle Speed). See supporting tables: **P060C_RoadLoad f (Vehicle Speed)**	Ignition State Accelerator pedal Remedial Action	Accessory, run or crank not applied is active	Up/down timer 2,000.00 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			greater than a threshold) -AND- Vehicle Speed is greater than	Table. f(Vehicle Speed).Table, f(Vehicle Speed). See supporting tables: **P060C_RoadLoad f (Vehicle Speed)** minus **P060C_DecelOffset f (VehicleSpeed)** Nm 50.00 kph				
			Creep Coast Axle Torque is out of bounds given by threshold range	High Threshold 1,747.24 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Positive Torque Offset is greater than its redundant calculation plus threshold OR Positive Torque Offset is less than its redundant calculation minus threshold	107.05 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Starter Relay Control Circuit Open (12VSS)	P0615	Controller specific output driver circuit diagnoses the Starter relay (12VSS) low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	>= 200 KOhms impedance between signal and controller ground.	Starter control diag enable Engine speed Run Crank voltage	Enabled >=0.00RPM >= 11.00 volts	40 failures out of 50 samples 50 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Starter Relay Control Circuit Low Voltage (12VSS)	P0616	Controller specific output driver circuit diagnoses the Starter relay (12VSS) low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 0.5 Ohms impedance between signal and controller ground	Starter control diag enable Engine speed Run Crank voltage	Enabled >=0.00RPM >=6.41 volts	8 failures out of 10 samples 50 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Starter Relay Control Circuit High Voltage (12VSS)	P0617	Controller specific output driver circuit diagnoses the Starter relay low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 0.5 Ohms impedance between signal and controller power	Starter control diag enable Engine speed Run Crank voltage	Enabled >=0.00RPM >=6.41 volts	40 failures out of 50 samples 50 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Relay Control Circuit Open	P0627	Controller specific output driver circuit diagnoses the Feed Fuel Pump Relay high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	>= 200 KOhms impedance between signal and controller ground.	Run/Crank Voltage	Voltage 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type A, 1 Trips Note: In certain controlle rs P0629 may also set (Fuel Pump Relay Control Short to Power)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Relay Control Circuit Low Voltage	P0628	Controller specific output driver circuit diagnoses the Feed Fuel Pump Relay high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 0.5 Ohms impedance between signal and controller ground	Run/Crank Voltage	Voltage 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Relay Control Circuit High Voltage	P0629	Controller specific output driver circuit diagnoses the Feed Fuel Pump Relay high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 0.5 Ohms impedance between signal and controller power	Run/Crank Voltage	Voltage 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type A, 1 Trips Note: In certain controllers P0627 may also set (Fuel Pump Relay Control Open Circuit)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Fuel Injector Control Performance	P062B	This DTC determines the internal fuel injctor control module circuit is faulted. The faulted status is set on any failure that could potentially damage the drivers or injectors, or could result in uncontrolled fueling. The following general classes of failures shall be covered: Communication error with control circuit Internal corruption of control circuit values, Invalid interface values (from control circuit)	Internal ECU Boost Voltage OR Internal ECU Boost Voltage OR Driver Status OR Driver Status	>= 90 Volts <= 40 Volts = Not Ready = Uninitialized	Battery Voltage	>= 8 or >= 11 Enabled when a code clear is not active or not exiting device control Engine is not cranking Powertrain Relay Voltage within range	High Voltage - 160 failures out of 200 samples Low Voltage - 160 failures out of 200 samples Driver Status Not Ready- 160 failures out of 200 samples Driver Status Uninitialized - Uninitialized state for >= 100 counts All at 12.5ms per sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Internal Control Module EEPROM Error	P062F	This DTC detects a NVM long term performance. There are two types of diagnostics that run during controller power up. One for HWIO reports that writing to NVM (at shutdown) will not succeed, and the other HWIO reports the assembly calibration integrity check has failed.	HWIO reports that writing to NVM (at shutdown) will not succeed				Diagnostic runs at controller power up.	Type B, 2 Trips
			HWIO reports the assembly calibration integrity check has failed				Diagnostic runs at controller power up.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
VIN Not Programmed or Mismatched - Engine Control Module (ECM)	P0630	This DTC checks that the VIN is correctly written	At least one of the programmed VIN digits	Is not a valid ASCII character	OBD Manufacturer Enable Counter	= 0	250 ms / test Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #1 Circuit	P0641	Detects a continuous or intermittent short on the 5 volt reference circuit #1 by monitoring the reference percent Vrefl and failing the diagnostic when the percent Vrefl is too low or too high or if the delta between the filtered percent Vrefl and non-filtered percent Vrefl is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vrefl < or ECM percent Vrefl > or the difference between ECM filtered percent Vrefl and percent Vrefl > (100% corresponds to 5.5 Volt)	88.64 % Vrefl 93.18% Vrefl 0.90 % Vrefl	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 25.00 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 187.5000 ms continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module 02 Sensor Processor Performance Bank 1) (For use with WRAF	P064D	Diagnoses the WRAF Application-Specific Integrated Circuit (ASIC) for Controller Status and Measure Valid faults. These faults can impact closed loop fuel control. This DTC when enabled, monitors the two different failure counters it receives from the WRAF ASIC. The individual diagnostic failure counters are incremented based on the message received from the ASIC. The DTC is set based on any of the two individual fail and sample counters.	B1S1 WRAF ASIC indicates control module faults	Controller Status fail counts and Measure Valid fail counts are accumulated to determine fault status	Diagnostic is Enabled Engine Run or Auto stop Heater Warm-up delay WRAF circuit diagnostic delay since power up	 = True = Complete > 20.0 sec	128 controller status fail counts out of 160 samples OR 128 measure valid fail counts out of 160 samples 25 ms /sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Unauthorized Software Calibration Detected	P064F	This DTC indicates that the ECU software has an invalid MACT (Message Authentication Code Table)	The MACT embedded in the ECU software is invalid	Invalid MACT	Calibration enable	= 1 Boolean	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #2 Circuit	P0651	Detects a continuous or intermittent short on the 5 volt reference circuit #2 by monitoring the reference percent Vref2 and failing the diagnostic when the percent Vref2 is too low or too high or if the delta between the filtered percent Vref2 and non-filtered percent Vref2 is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vref2 < or ECM percent Vref2 > or the difference between ECM filtered percent Vref2 and percent Vref2 > (100% corresponds to 5.5 Volt)	88.64 % Vref2 93.18% Vref2 0.90 % Vref2	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 25.00 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 187.5000 ms continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
LIN Generator System Performance	P065A	This diagnostic detects a fault leading the LIN Generator to not regulating properly.	|ECU voltage setpoint request - battery voltage|	>4.50[V]	Calibration on diagnostic enabling	1.00==TRUE	160.00 fail counts out of 200.00 sample counts	Type B, 2 Trips
					Diagnostic system disabled (clear code in progress, diagnostic re-enable in progress or end of trip processing in progress)	==FALSE	Functional task: 25 ms	
					LIN Generator present and enabled	1.00==TRUE		
					Engine running	==TRUE		
					System voltage low failure not present	LVT_SysVoltLowFA ==FALSE		
					LIN Generator commanded disabled	==FALSE		
					LIN Generator feedback communication Data Ready	==TRUE		
					LIN Generator feedback communication Fault Active	==FALSE		
					LIN Generator feedback communication Fault Pending	==FALSE		
					Mask function of voltage	41,417,983.00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					setpoint override source enumeration (each cal bit represents an override that shall be set to TRUE to enable the monitor during that particular override)			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Relay Control Circuit	P0685	Detects an open circuit in the Powertrain Relay driver. This diagnostic reports the DTC when an open circuit failure is present. Monitoring occurs when the output is powered off. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	Open Circuit: > 200 K 0 ohms impedance between output and controller ground	Powertrain relay Open circuit diagnostic diagnostic enable = TRUE Run/Crank Voltage	1.00 Voltage >11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0686 may also set (Powertrain Relay Control Short to Ground).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Relay Control Circuit Low Voltage	P0686	Detects a short to ground in the Powertrain Relay low side driver. This diagnostic reports the DTC when a short to ground failure is present. Monitoring occurs when the output is powered off. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	Short to ground: < 0.5 Q impedance between output and controller ground	Powertrain relay Low Side driver short to ground diagnostic diagnostic enable = TRUE Run/Crank Voltage	1.00 Voltage >11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controlle rs P0685 may also set (Powertr ain Relay Control Open Circuit).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Relay Control Circuit High Voltage	P0687	Detects a short to power in the Powertrain Relay low side driver. This diagnostic reports the DTC when a short to power failure is present. Monitoring occurs when the output is powered off. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	Short to power: < 0.5 Q impedance between output and controller power	Powertrain relay Low Side driver short to power diagnostic enable = TRUE Run/Crank Voltage	1.00 Voltage >11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Relay Feedback Circuit Low Voltage	P0689	Detects low voltage in the control module relay feedback circuit. This diagnostic reports the DTC when low voltage is present. Monitoring occurs when run crank voltage is above a calibrated value.	Control module relay feedback circuit low voltage	Powertrain relay voltage <=5.00	Powertrain relay short low diagnostic enable Run Crank voltage Powertrain relay state	= 1.00 >9.00 = ON	5 failures out of 6 samples 1000 ms/ sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Relay Feedback Circuit High Voltage	P0690	Detects higher than expected voltage in the powertrain relay feedback circuit. This diagnostic reports the DTC when higher than expected voltage is present. For example, the powertrain relay could be stuck on. Monitoring occurs when the relay is commanded "off' for a calibrated duration.	Powertrain Relay Voltage	>= 4.00 volts will increment the fail counter	Powertrain relay high voltage feedback circuit diagnostic enable = TRUE Powertrain relay commanded “OFF” No active DTCs:	1.00 >=2.00 seconds PowertrainRelayStateOn_FA	50 failures out of 63 samples 100ms /Sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on the 5 volt reference circuit #3 by monitoring the reference percent Vref3 and failing the diagnostic when the percent Vref3 is too low or too high or if the delta between the filtered percent Vref3 and non-filtered percent Vref3 is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vref3 < or ECM percent Vref3 > or the difference between ECM filtered percent Vref3 and percent Vref3 > (100% corresponds to 5.5 Volt)	88.64 % Vref3 93.18% Vref3 0.90 % Vref3	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 25.00 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 187.5000 ms continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #4 Circuit	P06A3	Detects a continuous or intermittent short on the 5 volt reference circuit #4 by monitoring the reference percent Vref4 and failing the diagnostic when the percent Vref4 is too low or too high or if the delta between the filtered percent Vref4 and non-filtered percent Vref4 is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vref4 < or ECM percent Vref4 > or the difference between ECM filtered percent Vref4 and percent Vref4 > (100% corresponds to 5.5 Volt)	88.64 % Vref4 93.18% Vref4 0.90 % Vref4	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 25.00 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 187.5000 ms continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Knock Sensor Processor 1 Performance	P06B6	This diagnostic checks for a fault with the internal test circuit (sensor #1) used only for the '20 kHz' method of the Open Circuit Diagnostic. A fault is present when the signal level from the 20 kHz range of the FFT output falls between the Open Test Circuit thresholds.	FFT Diagnostic Output	**> P06B6_P06B7_OpenTestCktThrshMin** **AND** **< P06B6_P06B7_OpenTestCktThrshMax** **See Supporting Tables**	Diagnostic Enabled? Engine Run Time Engine Speed Cumlative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow	Yes > 0.0 seconds > 650 RPM and < 4,750 RPM > 200 Revs > 10 mg/cylinder and < 2,000 mg/cylinder	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0200 Updated each engine event	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Knock Sensor Processor 2 Performance	P06B7	This diagnostic checks for a fault with the internal test circuit (sensor #2) used only for the '20 kHz' method of the Open Circuit Diagnostic. A fault is present when the signal level from the 20 kHz range of the FFT output falls between the Open Test Circuit thresholds.	Individual Sensor Threshold Enabled? FFT Diagnostic Output	0.00 , Use Case 1 **Case 1:** **> P06B6_P06B7_OpenTestCktThrshMin** **AND** < **P06B6_P06B7_OpenTestCktThrshMax** **See Supporting Tables** **Case 2:** > **P06B7_OpenTestCktMin2** **AND** < **P06B7_OpenTestCktMax2** **See Supporting Tables**	Diagnostic Enabled? Engine Run Time Engine Speed Cumlative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow	Yes > 0.0 seconds > 650 RPM and < 4,750 RPM > 200 Revs > 10 mg/cylinder and < 2,000 mg/cylinder	First Order Lag Filter with Weight Coefficient **Case 1 Weight Coefficient =** 0.0200 Updated each engine event **Case 2 Weight Coefficient =** 0.0200 Updated each engine event	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #5 Circuit	P06D2	Detects a continuous or intermittent short on the 5 volt reference circuit #5 by monitoring the reference percent Vref5 and failing the diagnostic when the percent Vref5 is too low or too high or if the delta between the filtered percent Vref5 and non-filtered percent Vref5 is too large. This diagnostic only runs when battery voltage is high enough.	ECM percent Vref5 < or ECM percent Vref5 > or the difference between ECM filtered percent Vref5 and percent Vref5 > (100% corresponds to 5.5 Volt)	88.64 % Vref5 93.18% Vref5 0.90 % Vref5	Diagnostic enabled AND [(Run/Crank voltage for Time period AND Starter engaged) OR (Run/Crank voltage AND Starter engaged)]	= 1 >6.41 Volts = 25.00 Seconds = FALSE >8.41 Volts = TRUE	19/39 counts; or 187.5000 ms continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Pressure Control Circuit/Open	P06DA	Controller specific output driver circuit diagnoses the oil pump low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	Open Circuit > 200 k Q impedance between output and controller ground	Powertrain Relay Voltage Run/Crank Active Cranking State	> 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type A, 1 Trips Note: In certain controlle rs P06DB may also set (Engine Oil Pressure Control Circuit Short To Ground)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Pressure Control Circuit Low	P06DB	Controller specific output driver circuit diagnoses the oil pump low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	Short to Ground Circuit < 0.5 0 impedance between output and controller ground	Powertrain Relay Voltage Run/Crank Active Cranking State	> 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type A, 1 Trips Note: In certain controlle rs P06DA may also set (Engine Oil Pressure Control Circuit Open)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Pressure Control Circuit High	P06DC	Controller specific output driver circuit diagnoses the oil pump low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	Short to Power < 0.5 Q impedance between output and controller power	Powertrain Relay Voltage Run/Crank Active Cranking State	> 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Oil Pump Control Circuit Performance - Continuously Variable Displacement Oil Pump	P06DD	Diagnoses the performance of the oil pump controls. The test determines if the oil pump is capable of meeting the pressure demand.	Absolute Oil Pressure Error =
			
			ABS [Desired Oil Pressure - Measured Oil Pressure]
			
			A rate limiter is applied to the absolute error value
			
			Rate limited pressure error=
			if ((Absolute Oil Pressure Error - Previous Absolute Oil Pressure Error) > <KeLUBC_dp_DiagPresErrRtLim>) {
			
			Rate Limited Pressure Error = <KeLUBC_dp_DiagPresErrRtLim> + Previous Absolute Oil Pressure Error;
			
			}else{
			
			Rate Limited Pressure Error Variation = Absolute Oil Pressure Error;
			
			}
			
			A first-order lag filter is applied to the Rate Limited Pressure Error value, every 100ms:
			
			Filtered Pressure Error = Previous Error + 0.00400 *(New Error - Previous
				Rate limited filtered Pressure Error > 40.00 kPa
				
				AND
				
				Cycler Algorithm has cycled the pump solenoid for 1.80 seconds
				
				AND
				
				Filtered Pressure Error > **P06DD_CVDOP_MaxPressErr** after the cycler is complete
					Common Criteria:
					
					Diagnosis enabled
					
					Closed Loop Pump Control Active
					
					Engine Running
					
					Powertrain Relay Voltage
					
					Desired Oil Pressure in Range
					
					Oil Temperature in Range
					
					Engine Speed in Range
						<KeLUBC_b_DiagEnable> TRUE
						
						> 10.0 seconds
						
						> 11.00
						
						P06DD_CVDOP_MinDesPres < Desired Oil Pressure < **P06DD_CVDOP_MaxDesPress**
						
						40.00 °C < Oil Temp < 120.00 °C
						
						1,250 RPM <= Engine Speed <= 4,500
						
						>=5.00
							Performed every 100ms.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Error) <u>Fail from passing state:</u> Filtered Oil Pressure Error is greater than a threshold AND the cycler algorithm is unable to clear the fault. <u>Pass from failing state:</u> Filtered Oil Pressure Error is less than a threshold	Filtered Pressure Error < **P06DD_CVDOP_Max PressErr**	Timer To Normal Conditions expired			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Unable to Engage Neutral	P073D	Detects the inability to achieve or remain in Neutral.	Actual Arbitrated Transmission Range, increment fail timer	≠Neutral	Actual Transmission Range Commanded Transmission Range AND CodeClearFunction AND ManufacturingModeActive AND: External: Run/Crank OR Accessory/Wakeup Internal: From the time when RunCrankActive until ActualRange AND Accessory/Wakeup	= Good value = Neutral =False =False =True = True =True =Park =False	fail time >= **Expected shift time**	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Unable to Engage Reverse	P073E	Detects the failure to achieve the expected command to Reverse range.	Actual Arbitrated Transmission Range, increment fail timer	≠Reverse	Actual Transmission Range Commanded Transmission Range AND CodeClearFunction AND ManufacturingModeActive AND: External: Run/Crank OR Accessory/Wakeup Internal: From the time when RunCrankActive until ActualRange AND Accessory/Wakeup	= Good value = Reverse =False =False =True =True =True =Park =False	fail time >= **Expected shift time**	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Sensor/ Switch A Circuit Low [Gen3 ETRS]	P07B3	The Park Button Circuit Diagnostic detects a reading Low	Shifter park Position measured Switch A signal	<=115.00	enabling calibration	1.00	20.00 failures out of 25.00 samples (SW runs at 25ms loop)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Sensor/ Switch A Circuit High [Gen3 ETRS]	P07B4	The Park Button Circuit Diagnostic detects a reading High	Shifter Park Position Measured Switch A signal	>= 236.00	enabling calibration	1.00	20.00 failures out of 25.00 samples (SW runs at 25ms loop)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Sensor/ Switch A Circuit Performance [Gen3 ETRS]	P07B5	The Park Button Circuit Diagnostic detects a reading that is outside of the PRESSED and RELEASED zones.	Shifter Park Position Measured Switch A signal	>184.00 and <188.00	DTC not set Enable Calibration	P07B3 OR P07B4 1.00	400.00 failures out of 480.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Sensor/ Switch B Circuit Low [Gen3 ETRS]	P07B9	The Park Button Circuit Diagnostic detects a reading Low	Shifter Park Position Measured Switch B signal	<= 115.00	Enable Calibration	1.00	20.00 failures out of 25.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Sensor/ Switch B Circuit High [Gen3 ETRS]	P07BA	The Park Button Circuit Diagnostic detects a reading High	Shifter Park Position Measured Switch B signal	>= 236.00	Enable Calibration	1.00	20.00 failures out of 25.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Sensor/ Switch B Circuit Performance [Gen3 ETRS]	P07BB	The Park Button Circuit Diagnostic detects a reading that is outside of the PRESSED and RELEASED zones.	Shifter Park Position Measured Switch B signal	>184.00 and <188.00	DTC not set Diagnostic Enable Calibration	P07B9 OR P07BA 1.00	400.00 failures out of 480.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Switch A/B Correlation	P07BE	Correlation diagnosic compares the two switches behind the Park pushbutton	Compares Park Switch A and Park Switch B "PRESSED" and "RELEASED" states. Park 1 and Park 2 are both:	=Valid, but not equal continuously = valid states (RELEASED or PRESSED), but disagree.	Not Fault Active Diagnostic System Disable Calibration: Park Comparison Diagnostics Enable Calibration: Vehicle speed:	P07B3, P07B4, P07B5, P07B9, P07BA, P07BB =FALSE = TRUE <= Park Request Spd, calibrated with a hysteresis loop: 8.00 and 7.50.	4,800 failures out of 6,000 samples 12.5 ms rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Unable to Engage Park	P07E4	Detects the inability to achieve or remain in Park.	Actual Arbitrated Transmission Range, increment fail timer	#Park	Actual Transmission Range Commanded Transmission Range AND CodeClearFunction AND ManufacturingModeActive AND: External: Run/Crank OR Accessory/Wakeup Internal: From the time when RunCrankActive until ActualRange AND Accessory/Wakeup	= Good value = Park =False =False =True = True =True =Park =False	fail time >= **Expected shift time**	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Unable to Engage Drive	P07E5	Detects the failure to achieve the expected command to Drive range.	Actual Arbitrated Transmission Range, increment fail timer	#Drive	Actual Transmission Range Commanded Transmission Range AND CodeClearFunction AND ManufacturingModeActive AND: External: Run/Crank OR Accessory/Wakeup Internal: From the time when RunCrankActive until ActualRange AND Accessory/Wakeup	= Good value = Drive =False =False =True = True =True =Park =False	fail time >= **Expected shift time**	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Gear Lever X Position Sensor 1 Circuit Range/ Performance [Gen3 ETRS]	P082A	Detects Gear Lever X Position Sensor 1 circuit is reading outside expected values	Gear Lever Position Measured Alphal on Sensor 1 OR percentages disagree	Outside shifter path of movement >= **Alpha Disagreement Limit** See Supporting Tables	Diagnostic Enable Calibration	1.00	10.00 failures out of 12.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Gear Lever Y Position Sensor 1 Circuit Performance [Gen3 ETRS]	P082D	Detects Gear Lever Y Position Sensor 1 circuit is reading outside expected values	Gear Lever Position Measured Beta 1 on Sensor 1 OR percentages disagree by	Outside shifter path of movement >= **Beta Disagreement Limit** See Supporting Tables	Diagnostic Enable Calibration	1.00	10.00 failures of of 12.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Gear Lever X Position Sensor 2 Circuit Performance [Gen3 ETRS]	P089B	Detects Gear Lever X Position Sensor 2 circuit is reading outside expected values	Gear Lever Position Measured Alpha 2 on Sensor 2 OR percentages disagree	Outside shifter path of movement >= **Alpha Disagreement Limit** See Supporting Tables	Diagnostic Enable Calibration	1.00	10.00 failures out of 12.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Gear Lever Y Position Sensor 2 Circuit Performance [Gen3 ETRS]	P08A0	Detects Gear Lever Y Position Sensor 2 circuit is reading outside expected values	Gear Lever Position Measured beta 2 on Sensor 2 OR percentages disagree	Outside shifter path of movement >= **Beta Disagreement Limit** See Supporting Tables	Diagnostic Enable Calibration	1.00	10.00 failures out of 12.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DC/DC Converter Voltage SensorA Range/ Performance	P0E32	Detects DC/DC Converter Actuator Voltage 1 Performance issues	Bypass Mode: Absolute value of voltage difference between DC/ DC Converter Actuator Voltage Raw Value 1 and ECM Run/Crank	> 2 Volt	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Engine running OR Engine stopped Battery Voltage	1 1 TRUE TRUE FALSE for > 160 loops in 12.50 ms loop for > 160 loops in 12.50 ms loop >= 6.60 Volts	320 failed samples out of 400 samples in 12.50 ms loop	Type B, 2 Trips
			Stabilize Mode- Auto-Cranking: Absolute value of voltage difference between DC/ DC Converter Actuator Voltage Raw Value 1 and ECM Run/Crank	> 2 Volt	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Engine auto-cranking Battery Voltage	1 1 TRUE TRUE FALSE for > 0 loops in 12.50 ms loop >= 6.60 Volts	8 failed samples out of 16 samples in 12.50 ms loop	
			Stablize Mode-Auto-Cranking Events: Number of failed auto-cranking events exceeds threshold	> 2 failed auto-cranking events	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory)	1 1 TRUE	2 failed auto-crank events out of 3 consecutive auto-crank events	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Engine auto-cranking	TRUE FALSE has occurred		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DC/DC Converter Voltage SensorA Low	P0E33	Diagnoses the DC/DC Converter Actuator Voltage Sensor Circuit 1 for short to ground faults.	DC/DC Converter Actuator Voltage Raw Value 1	< 1 Volt	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Battery Voltage	1 1 TRUE TRUE FALSE >= 6.60 Volts	320 failed samples out of 400 samples in 12.50 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DC/DC Converter Voltage SensorA High	P0E34	Diagnoses the DC/DC Converter Actuator Voltage Sensor Circuit 1 for short to battery faults.	DC/DC Converter Actuator Voltage Raw Value 1	> 28 Volt	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Battery Voltage	1 1 TRUE TRUE FALSE >= 6.60 Volts	320 failed samples out of 400 samples in 12.50 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DC/DC Converter Voltage Sensor B Range/ Performance	P0E37	Detects DC/DC Converter Actuator Voltage 2 Performance issues	Bypass Mode: Absolute value of voltage difference between DC/ DC Converter Actuator Voltage Raw Value 2 and ECM Run/Crank	> 2 Volt	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Engine running OR Engine stopped Battery Voltage	1 1 TRUE TRUE FALSE for > 160 loops in 12.50 ms loop for > 160 loops in 12.50 ms loop >= 6.60 Volts	320 failed samples out of 400 samples in 12.50 ms loop	Type B, 2 Trips
			Stabilize Mode- Auto-Cranking: Absolute value of voltage difference between DC/ DC Converter Actuator Voltage Raw Value 2 and ECM Run/Crank	> 2 Volt	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Engine auto-cranking Battery Voltage	1 1 TRUE TRUE FALSE for > 0 loops in 12.50 ms loop >= 6.60 Volts	8 failed samples out of 16 samples in 12.50 ms loop	
			Stablize Mode-Auto-Cranking Events: Number of failed auto-cranking events exceeds threshold	> 2 failed auto-cranking events	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory)	1 1 TRUE	2 failed auto-crank events out of 3 consecutive auto-crank events	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Engine auto-cranking	TRUE FALSE has occurred		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DC/DC Converter Voltage Sensor B Low	P0E38	Diagnoses the DC/DC Converter Actuator Voltage Sensor Circuit 2 for short to ground faults.	DC/DC Converter Actuator Voltage Raw Value 2	< 1 Volt	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Battery Voltage	1 1 TRUE TRUE FALSE >= 6.60 Volts	320 failed samples out of 400 samples in 12.50 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DC/DC Converter Voltage Sensor B High	P0E39	Diagnoses the DC/DC Converter Actuator Voltage Sensor Circuit 2 for short to battery faults.	DC/DC Converter Actuator Voltage Raw Value 2	> 28 Volt	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) Battery Voltage	1 1 TRUE TRUE FALSE >= 6.60 Volts	320 failed samples out of 400 samples in 12.50 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Stop/Start System Performance	POFFF	This diagnostic sets when either a Failed AutoStart (FAS) or a Failed Flying Start (FFS) is detected (the latter logic is enabled only on hybrid vehicles capable of Stealth mode). FAS means that an autostart attempt has failed and the retry strategy has not been successful in re-starting the engine, FFS means that a Flying Start attempt has failed and the retry strategy has not been successful in completing the transition from electric to ICE propulsion. The Flying Start is divided in 3 different main phases. The first phase consists in an engine start request and this state is kept while the engine is starting. When the Engine changes its state in Running, the phase 2 shall start.This phase consists in the Engine performing Idle/ Fuel Stabilization required when required from Catalyst Light Off	A successful Auto Start has occurred using the primary auto start actuator.	Engine Start Stop State = ENGINE RUNNING	Engine Start Stop State Previous During last transition of Engine Start Stop State from ENGINE OFF to ENGINE STARTING: Propulsion System Active AND Remedial Action Start Request Actuator Low Voltage	!= ENGINE RUNNING = TRUE = FALSE	Pass condition met for 12.5 ms (1 sample)	Type B, 2 Trips
			A successful Flying Start has occurred.	Electric Vechile Mode Exit Phase = COMPLETE	Enabled by calibration Electric Vechile Mode Exit Phase Previous	0.00 = PHASE 3	Pass condition met for 12.5 ms (1 sample)	
			Pass criteria are met when conditions below are reached on a single driving cycle: a. Driving cycle started with a succesful Key-Start b. Vehicle speed c. Secondary Axle Torque conditions b and c fulfilled for a time	TRUE > KeESSR_v_DiagMinVehSpd < KeESSR_M_DiagMaxSecAxlTorq > KeESSR_t_DiagSpdAndTorqSyncTmr	Enabled by calibration Failed Flying Start detected on previous cycles	0.00 TRUE	Pass condition met for 12.5 ms (1 sample)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		(CLO). When the phase 2 is terminated or skipped, the phase 3 shall start. This phase shall last until Transmission and Engine sync is occurred. The maneuver is completed when the Engine and Transmission are able to produce the requested torque at the axle.	After an Auto Stop, the engine was not successfully restarted and the retry strategy was not available or was not successful in restarting the engine. Note: When attempting to restart the engine, only 1 start retry is allowed per available actuator for each Auto Start event. The number of total retries (all available actuators) is calibratible and limited each key cycle to 255.00 retry attempt(s). Note: Low Fuel Condition is always determined in the ECM.	Engine Start Fail = TRUE	P31C2 Low Fuel Condition Engine Positioning Fault (Cam or Crank) Propulsion Allowed Vehicle is not in the assembly plant	= NOT Fault Active = FALSE (% Total Fuel Level < 10.00% for > 30.00 sec) = FALSE = TRUE	Fail condition met for 12.5 ms (1 sample)	
			During a Flying Start the engine was not successfully started or the engine stalled and the retry strategy was not able to recover the process. The number of total retries is calibratible and limited each key cycle to (KeESSR_Cnt_MaxRetry FlyStrt) retry attempt(s). Note: Low Fuel Condition is always determined in	Flying Start Fail = TRUE	Enabled by calibration Low Fuel Condition Engine Positioning Fault (Cam or Crank) Propulsion Allowed Vehicle is not in the assembly plant	0.00 = FALSE (% Total Fuel Level < 10.00% for > 30.00 sec) = FALSE = TRUE	Fail condition met for 12.5 ms (1 sample)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			the ECM.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Reset Error	P1005	This diagnostic is intended to monitor a message from the Fuel Pump Driver Control Module/Fuel Tank Zone Module and use the information in the message to diagnose if the module is resetting unexpectedly. The message contains the time since the last reset as measured by the module. If the time since the last reset decreases from one message to another without indicating that a timer rollover occurred, a reset of the external module will be indicated. If too many resets occur in a sample window the diagnostic will fail.	If the diagnostic has detected that an unexpected reset has occured: The time since last module reset event data value received from the FPDCM/FTZM is less than the previous value and also And The rollover occurred value received from the FPDCM/FTZM is false for out of total samples	<=0.50 seconds >=2.00 counts >=400.00 counts	DTC is enabled Sensor bus relay is on Battery voltage No FTZM reconfiguration is requested for A new message that contains the FPDCM/ FTZM reset data is received The following DTCs that diagnose the message that contains the FPDCM/ FTZM reset data are not active: P1000 U18A2	Enabled > 11.00 Volts 1.00 second(s)	This diagnostic samples every 100.00 milliseconds.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Phase U-V-W Circuit Open	P1029	This DTC detects if any of the 3phase fuel pump control circuits is Open [system configuration "Brushless"] The diagnostic can detect open circuit faults when the fuel pump is not rotating. In the "stopped" state, small currents are injected into each motor phase circuit pair by an internal fixed source and corresponding back-EMF voltage is monitored. A fault is reported when the monitored voltage falls into a specific range [adjusted for source voltage]. This process is completed in less than 1 millisecond. The FTZM ERFS control samples back-Electromotive Force [EMF] for zero voltage-level crossings as a detection method to enable closed loop control brushless commutation. Back EMF is an electrical characteristic of the inactive phase of the 3-phase signal wherein only 2 phases are	Phased-pair circuit voltage	3V <= V [back-EMF] <= 6V	a) Sensed fuel pump speed b) Device configuration Chassis Fuel Pres System type c) Diagnostic is .. d) CAN Sensor Bus message $3EC Available e) Sensor Bus Relay On f) Sensor Bus B Message $3EC Temp Signal Message Counter Incorrect [Info7]	a) == 0 RPM b) == Brushless motor c) ENABLED d) == TRUE e) == TRUE f) == False	40.00 failures / 80.00 samples 1 sample / 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		active at any moment. Brushless fuel pump speed is inferred using the rate of zero-crossings detection and number of motor pole-pairs. Speed is reported to the ECM as serial data every 10 milliseconds. This open circuit diagnostic follows "smart device" Component Technical Specifications.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Phase U-V-W Circuit Low	P102A	This DTC detects if the fuel pump control circuit is shorted to low [Short to Ground] The diagnostic detects short-to-ground faults using 2 methods depending on whether the fuel pump is rotating. 1) In the "rotating" state, voltage drop across each phase-pair high-side drive is monitored, or 2) in the "stopped" state, small currents are injected into each motor phase circuit pair by an internal fixed source and corresponding back-EMF voltage is monitored. A fault is reported when the monitored voltage falls into a specific range [adjusted for source voltage]. The FTZM ERFS control samples back-Electromotive Force [EMF] for zero voltage-level crossings as a detection method to enable closed loop control brushless commutation. Back EMF is an electrical characteristic of the inactive phase of the 3-	Phased-pair circuit voltage Difference	Vdelta > 0.145 V	a) Chassis Fuel Pres System type Device configuration b) Diagnostic is .. c) CAN Sensor Bus message $3EC_Avail d) Sensor Bus Relay On e) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect [Info7]	a) == Brushless motor b) Enabled c) == TRUE d) == TRUE e) == False	40.00 failures / 80.00 samples 1 sample / 12.5 ms	Type A, 1 Trips
			Phased-pair circuit voltage	V [back-EMF] >= 6 V	a) Sensed fuel pump speed b) Chassis Fuel Pres System type Device configuration c) Diagnostic is .. d) CAN Sensor Bus message $3EC Available e) Sensor Bus Relay On f) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect [Info7]	a) == 0 RPM b) == Brushless motor c) Enabled d) == TRUE e) == TRUE f) == False	40.00 failures / 80.00 samples 1 sample / 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		phase signal wherein only 2 phases are active at any moment. Brushless fuel pump speed is inferred using the rate of zero-crossings detection and number of motor pole-pairs. Speed is reported to the ECM as serial data every 10 milliseconds. This open circuit diagnostic follows "smart device" Component Technical Specifications.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Phase U-V-W Circuit High	P102B	This DTC detects if the fuel pump control circuit is shorted to high voltage [Short to Battery] The diagnostic detects short-to-battery faults using 2 methods depending on whether the fuel pump is rotating. 1) In the "rotating" state, voltage drop across each phase-pair low-side current shunt is monitored, or 2) in the "stopped" state, small currents are injected into each motor phase circuit pair by an internal fixed source and corresponding back-EMF voltage is monitored. A fault is reported when the monitored voltage falls into a specific range [adjusted for source voltage]. The FTZM ERFS control samples back-Electromotive Force [EMF] for zero voltage-level crossings as a detection method to enable closed loop control brushless commutation. Back EMF is an electrical characteristic of the	Phased-pair circuit voltage Difference	Vdelta > 0.4 V	a) Diagnostic is .. b) Device configuration Chassis Fuel Pressure SysType == FTZM Electronically Commutated c) CAN Sensor Bus message $3EC_Avail d) Sensor Bus Relay On e) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect	a) Enabled b) == TRUE c) == TRUE d) == TRUE e) == False	40.00 failures/ 80.00 samples 1 sample / 12.5 ms	Type A, 1 Trips
			Phased-pair circuit voltage	V[backEMF] > 6 V	a) Diagnostic is .. b) Sensed fuel pump speed b) Device configuration Fuel Pressure System Type == FTZM Electronically Commutated c) CAN Sensor Bus message $3EC_Avail d) Sensor Bus Relay On e) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect	a) Enabled b) == o RPM b) == TRUE c) == TRUE d) == TRUE e) == False	40.00 failures/ 80.00 samples 1 sample / 12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		inactive phase of the 3-phase signal wherein only 2 phases are active at any moment. Brushless fuel pump speed is inferred using the rate of zero-crossings detection and number of motor pole-pairs. Speed is reported to the ECM as serial data every 10 milliseconds. This open circuit diagnostic follows "smart device" Component Technical Specifications.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Wastegate Actuator "A" Control Circuit Shorted	P103A	Controller specific output driver circuit diagnostic, diagnosing for the 'electric waste gate actuator A actuator' H-bridge driver load short failure. In series applications, turbocharger 'A is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A is associated with engine bank 1.	Voltage measurement outside of controller specific acceptable range during driver on state indicates a load short failure.	< 0.5 Q impedance between motor output A and motor output B	Diagnostic enabled ********** Powertrain relay voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts **********	10 failures out of 12 samples 100ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve C Position Sensor Stop Performance (HEAT - RRV)	P1098	Performance Check This DTC checks for an invalid endstop learn. The valve is moved against each endstop. If the learned position is out of range a DTC will be set.	If any of the following conditions are met a failure will be recorded: Condition 1 (closed): Learned bypass valve position or and the learn has completed Condition 2 (open): Learned bypass valve position or and the learn has completed	>5.00 degrees <-8.00 degrees >307.00 degrees <292.00 degrees	Diagnostic is Enabled No DTCs Engine Diag System Bypass Valve Learn Engine Outlet Coolant OR OBD Coolant Enable Criteria Engine Outlet Coolant AND Engine Hot Light	EECR_EngineOutlet_FA RRV_PstnSnsr_FA = Enabled = Successful or Inprogress > -39.00 °C = TRUE < 150.00 °C = Inactive	Within 60.00 seconds after engine shutdown.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 1 Injection Pulse Performance	P10A3	Diagnostic to determine if injection pulse total compensation for cylinder 1 is less than the minimum fail limit. The injection pulse total compensation is the sum of the opening magnitude and closing time compensation. Opening Magnitude and closing time compensation are determined using the voltage feedback across the injector enable and command wires.	Total Injection Small Pulse compensation	< **P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) FULR_b_FPV_MeasDiag_TFTKO Uncompensated Injection Pulse Width (Injection is commanded)	= True = True > 0	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 1 Injection Pulse Performance	P10A4	Diagnostic to determine if injection pulse total compensation for cylinder 1 is greater than the maximum fail limit. The injection pulse total compensation is the sum of the opening magnitude and closing time compensation. Opening Magnitude and closing time compensation are determined using the voltage feedback across the injector enable and command wires.	Total Injection Small Pulse compensation	> **P10A4 P10A6 P10A8 P10AAP10AC P10AE P10B0 P10B2- Maximum Small Pulse Compensation Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) FULR_b_FPV_MeasDiag_TFTKO Uncompensated Injection Pulse Width (Injection is commanded)	= True = True > 0	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 2 Injection Pulse Performance	P10A5	Diagnostic to determine if injection pulse total compensation for cylinder 2 is less than the minimum fail limit. The injection pulse total compensation is the sum of the opening magnitude and closing time compensation. Opening Magnitude and closing time compensation are determined using the voltage feedback across the injector enable and command wires.	Total Injection Small Pulse compensation	< **P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) FULR_b_FPV_MeasDiag_TFTKO Uncompensated Injection Pulse Width (Injection is commanded)	= True = True > 0	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 2 Injection Pulse Performance	P10A6	Diagnostic to determine if injection pulse total compensation for cylinder 2 is greater than the maximum fail limit. The injection pulse total compensation is the sum of the opening magnitude and closing time compensation. Opening Magnitude and closing time compensation are determined using the voltage feedback across the injector enable and command wires.	Total Injection Small Pulse compensation	> **P10A4 P10A6 P10A8 P10AAP10AC P10AE P10B0 P10B2- Maximum Small Pulse Compensation Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) FULR_b_FPV_MeasDiag_TFTKO Uncompensated Injection Pulse Width (Injection is commanded)	= True = True > 0	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 3 Injection Pulse Performance	P10A7	Diagnostic to determine if injection pulse total compensation for cylinder 3 is less than the minimum fail limit. The injection pulse total compensation is the sum of the opening magnitude and closing time compensation. Opening Magnitude and closing time compensation are determined using the voltage feedback across the injector enable and command wires.	Total Injection Small Pulse compensation	< **P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) FULR_b_FPV_MeasDiag_TFTKO Uncompensated Injection Pulse Width (Injection is commanded)	= True = True > 0	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 3 Injection Pulse Performance	P10A8	Diagnostic to determine if injection pulse total compensation for cylinder 3 is greater than the maximum fail limit. The injection pulse total compensation is the sum of the opening magnitude and closing time compensation. Opening Magnitude and closing time compensation are determined using the voltage feedback across the injector enable and command wires.	Total Injection Small Pulse compensation	> **P10A4 P10A6 P10A8 P10AAP10AC P10AE P10B0 P10B2- Maximum Small Pulse Compensation Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) FULR_b_FPV_MeasDiag_TFTKO Uncompensated Injection Pulse Width (Injection is commanded)	= True = True > 0	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 4 Injection Pulse Performance	P10A9	Diagnostic to determine if injection pulse total compensation for cylinder 4 is less than the minimum fail limit. The injection pulse total compensation is the sum of the opening magnitude and closing time compensation. Opening Magnitude and closing time compensation are determined using the voltage feedback across the injector enable and command wires.	Total Injection Small Pulse compensation	< **P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) FULR_b_FPV_MeasDiag_TFTKO Uncompensated Injection Pulse Width (Injection is commanded)	= True = True > 0	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 4 Injection Pulse Performance	P10AA	Diagnostic to determine if injection pulse total compensation for cylinder 4 is greater than the maximum fail limit. The injection pulse total compensation is the sum of the opening magnitude and closing time compensation. Opening Magnitude and closing time compensation are determined using the voltage feedback across the injector enable and command wires.	Total Injection Small Pulse compensation	> **P10A4 P10A6 P10A8 P10AAP10AC P10AE P10B0 P10B2- Maximum Small Pulse Compensation Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) FULR_b_FPV_MeasDiag_TFTKO Uncompensated Injection Pulse Width (Injection is commanded)	= True = True > 0	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Pump Speed Performance	P10BA	This DTC indicates a pump speed performance failure. Two fault paths are considered. When pump is commanded with pump speed > 0 and commanded pump speed = 0. When the On path fails, the off path is disabled until the ON path completes a OK cycle.	Absolut pump speed error =Abs(Desired pump speed - Actual Pump Speed) For more than	> **PumpSpdPerfErrorLim** rpm > **PmpSpdPerfDiagDly** sec	Pump H/W present Diagnostic enabled ********** Desired pump speed ********** Powertrain relay voltage Or WCP direct connected too Batt (Coolant Temp OR OBD Coolant enable Criteria) AND (Coolant Temp OR OBD max Coolant Temp achieved) ********** - Pump enabled - Engine does not crank - Diagnostic system not disabled - No CAC device control acitve - No Fault active ICP_CWP_LcFA ICP_CWP_Rsp_FoFA	True True ********** > 0 rpm ********** >=11.0 Volts False >10.00C =TRUE <= 126.00 C =FALSE **********	16 failures out of 20 samples 1000ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure Sensor AZ C Correlation	P10BC	Detects a performance failure in the Barometric Pressure (BARO) sensor, such as when a BARO value is stuck in range. With this monitor, the BARO sensor is compared to a redundant sensor called BARO C. If the BARO sensor value is not similar to the BARO C sensor value, then the BARO Sensor A/C Correlation diagnostic will fail.	Difference between BARO A Sensor reading and BARO C Sensor reading	> 15.0 kPa	Diagnostic is Enabled LIN communications established with MAF		160 failures out of 200 samples 1 sample every 25 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Press Regulator Solenoid Control Circuit Short	P10E8	Controller specific output driver circuit diagnoses High Pressure pump Control Solenoid high sided driver for a short to low side when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 1.1 or 15 Amps selectable thershold based on High pressure Pump.	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Inlet Airflow System Performance (single turbo)	P1101	Detects a performance failure in the Manifold Pressure (MAP) sensor, Turbocharger Boost Pressure sensor, Throttle Position sensor (TPS) or Mass Air Flow (MAF) sensor that cannot be uniquely identified as a failure in one individual sensor. This diagnostic can set when more than one of these sensors has a performance concern. This diagnostic is performed using the Intake Flow Rationality Diagnostic (IFRD). IFRD calculates modeled values of sensors from these four sensors. These modeled values are compared against the actual sensor values to see if they are similar. If they are similar, then the model passes. If they are not similar, then that model is considered to be failed. Certain combinations of model passes and model failures can be interpreted to be caused by a performance issue with	See table **P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when ABS(Measured Flow - Modeled Air Flow) Filtered MAPI model fails when ABS(Measured MAP - MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP - MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP - MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP - TIAP Model 1) Filtered TPS model fails when Filtered Throttle Model Error TIAP Correlation model fails when High Engine Air Flow is TRUE AND Measured TIAP -	> 25.2 grams/sec > 20.0 kPa > 25.0 kPa > 25.0 kPa > 30.5 kPa > 250 kPa*(g/s)	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria (Coolant Temp OR OBD Max Coolant Achieved Intake Air Temp Intake Air Temp Powertrain Relay Voltage for a period of time Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables.	>= 400 RPM <= 5,700 RPM >= -9 Deg C = TRUE) <= 130 Deg C = FALSE) -20 Deg C <= 100 Deg C >= 9.1 Volts >= 0.2 Seconds >= 0.50 Modeled Air Flow Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM and MAF Est** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAPI Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		the system, but no single failed sensor can uniquely be identified. In this case, the Inlet Airflow System Performance diagnostic will fail.	measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101:TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is TRUE when Mass Air Flow	> 30.0 kPa > 30.0 kPa > 1.0 seconds > 1.0 seconds > a threshold in gm sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow**	No Active DTCs: No Pending DTCs:	**P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA MAF_SensorCircuitFA CrankSensor_FA IAT_SensorFA EECR_EngineArbitrated_FA EECR_EngineOutlet_CktFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault IAT_SensorCircuitFP MnfdTempSensorCktFP		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			AND Manifold Pressure	> a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**	Diagnostic is Enabled			
			AND Filtered Mass Air Flow - Mass Air Flow	< 1.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP**				
			AND Mass Air Flow - Filtered Mass Air Flow	< 3.0 gm/sec				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT SIDI High Pressure Rail Temperature Sensor Performance	P111F	This DTC Diagnoses Fuel Temperature sensors rationality by comparing Primary sensor (T1) vs. Secondary sensor (T2)	Fuel Temperature Error (Absolute delta between sensori and sensor2)	> 15.00 degC	Fuel Temperature Rationality Diagnostic Enabled No Fault Active on No Fault Pending on	True Enabled when a code clear is not active or not exiting device control Temperature sensors 1 out of range Low or High Fault Active (P0182, P0182) Temperature sensors 2 out of range Low or High (P0187, P0188) SENT Communication Fault Active (U0625, U101B, U0670, U0671) SENT Intenal Error Fault Active (P126E, P126F) Fuel Temperature Sensor SENT Message Error Fault Active (P128C, P128D) SENT Communication Fault Pending (U0625, U101B, U0670, U0671) Fuel Temperature Sensor SENT Message Error Fault Pending (P128C, P128D)	100.00 failures out of 125.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module 5V Reference 1 Circuit	P1176	This DTC monitors for an error in the Fuel Pump Driver Control Module 5V Reference 1 Circuit.	Raw Fuel Pump Driver Control Module 5V Reference 1 is or Raw Fuel Pump Driver Control Module 5V Reference 1 is or Absolute difference of the filtered Fuel Pump Driver Control Module 5V Reference 1 and Raw Fuel Pump Driver Control Module 5V Reference 1 is For a non-continuous failure of out of For a continuous failure of	>92.25 Percent <87.75 Percent > 0.90 Percent 40.00 counts 80.00 counts 0.20 seconds	Diagnostic is enabled Run/Crank Ignition Voltage PT Sensor Bus Relay The following DTCs that diagnose the message that contains the FPDCM/ FTZM reference circuit data are not active: P165C U0076 U18A2	Enabled >=11.00 Volts Commanded on (if present)	Samples every 6.00 milliseconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module 5V Reference 2 Circuit	P1177	This DTC monitors for an error in the Fuel Pump Driver Control Module 5V Reference 2 Circuit.	Raw Fuel Pump Driver Control Module 5V Reference 2 is or Raw Fuel Pump Driver Control Module 5V Reference 2 is or Absolute difference of the filtered Fuel Pump Driver Control Module 5V Reference 2 and Raw Fuel Pump Driver Control Module 5V Reference 2 is For a non-continuous failure of out of For a continuous failure of	>92.25 Percent <87.75 Percent > 0.90 Percent 40.00 counts 80.00 counts 0.20 seconds	Diagnostic is enabled Run/Crank Ignition Voltage PT Sensor Bus Relay The following DTCs that diagnose the message that contains the FPDCM/ FTZM reference circuit data are not active: P165C U0076 U18A2	Enabled >=11.00 Volts Commanded on (if present)	Samples every 6.00 milliseconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 low side circuit shorted to high side circuit	P1248	Controller specific output driver circuit diagnoses injector 1 high sided driver for a short to low sided driver failure when the output is powered on by comparing a voltage measurement to controller specific voltage threshold	Voltage measurement outside of controller specific acceptable range during driver on state indicates high sided driver for a short to low sided driver failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for high sided driver for a short to low sided driver failure.	25 amp >= through low side driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 low side circuit shorted to high side circuit	P1249	Controller specific output driver circuit diagnoses injector 2 high sided driver for a short to low sided driver failure when the output is powered on by comparing a voltage measurement to controller specific voltage threshold	Voltage measurement outside of controller specific acceptable range during driver on state indicates high sided driver for a short to low sided driver failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for high sided driver for a short to low sided driver failure.	25 amp >= through low side driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector3 low side circuit shorted to high side circuit	P124A	Controller specific output driver circuit diagnoses injector 3 high sided driver for a short to low sided driver failure when the output is powered on by comparing a voltage measurement to controller specific voltage threshold	Voltage measurement outside of controller specific acceptable range during driver on state indicates high sided driver for a short to low sided driver failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for high sided driver for a short to low sided driver failure.	25 amp >= through low side driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 low side circuit shorted to high side circuit	P124B	Controller specific output driver circuit diagnoses injector 4 high sided driver for a short to low sided driver failure when the output is powered on by comparing a voltage measurement to controller specific voltage threshold	Voltage measurement outside of controller specific acceptable range during driver on state indicates high sided driver for a short to low sided driver failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for high sided driver for a short to low sided driver failure.	25 amp >= through low side driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Over Temperature	P1255	To detect if an internal fuel pump driver over-temperature condition exists under normal operating conditions. The FTZM ERFS control may adjust the PWM slew rate or frequency as a self-protection method, but may not reduce pump rotational speed or impact pumping performance in any way due to an over-temperature condition.	Fuel Pump Driver Temperature	T > 160 degC	a) Diagnostic is .. b) Sensor Bus Relay On c) CAN Sensor Bus message $3EC_Available d) Sensor Bus Message $3EC Temp Signal Message Counter Incorrect [CFMR_b_FTZM_Info7_ARC_ChkErr]	a) Enabled b) == TRUE c) == TRUE d) <> TRUE	5.00 failures/ 10.00 samples 1 sample / 100 millisec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Temperature Sensor 1 Internal Fault - Error Code	P126E	This DTC Diagnoses the SENT Fuel Temperature Sensor 1 internal failure	Fuel Temperature Sensor 1 SENT digital read value	>= 4,089.00	No Fault Active on No Fault Pending on	Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (U0625, U101B, U0670, U0671) Fuel Temperature Sensor SENT Message Error Fault Active (P128C) Fuel Temperature Sensor SENT Message Error Fault Pending (P128C)	50.00 failures out of 62.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Temperature Sensor 2 Internal Fault - Error Code	P126F	This DTC Diagnoses the SENT Fuel Temperature Sensor 2 internal failure	Fuel Temperature Sensor 2 SENT digital read value	>= 4,089.00	No Fault Active on No Fault Pending on	Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (U0625, U101B, U0670, U0671) Fuel Temperature Sensor SENT Message Error Fault Active (P128D) Fuel Temperature Sensor SENT Message Error Fault Pending (P128D)	50.00 failures out of 62.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail High Pressure Sensor 2 Out of Range	P127C	This DTC diagnose SENT high pressure sensor 2 that is too low out of range. If the sensor digital value (repressing the refernce voltage) is below the lower digital threshold, the low fail counter then increments. If the low fail counter reaches its threshold then a fail is reported. A pass is reported for this DTC if the low sample counter reaches its threshold.	High Pressure Rail Sensor 2 SENT digital read value	=< 66			Time Based: 400 Failuer out of 500 Samples 6.25 ms per Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Pressure Sensor 1 Internal Performance	P128A	This DTC determines if there is internal error within the SENT pressure sensor 1 (i.e. Broken wire bond internal to the SENT Sensor). Once the internal error is detected a fixed faulted digital values is communicated to the ECU.	Digital pressure sesnor 1 value	>= 4,089	SENT Fuel Rail Pressure Sensor Internal Performance Enable No Fault Pending	Enabled when a code clear is not active or not exiting device control True U0625 P16E5 P128F	420 failures out of 525 samples 6.25 ms per Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Pressure Sensor 2 Internal Performance	P128B	This DTC determines if there is internal error within the SENT pressure sensor 2 (i.e. Broken wire bond internal to the SENT Sensor). Once the internal error is detected a fixed faulted digital values is communicated to the ECU.	Digital pressure sesnor 2 value	>= 4,089	SENT Fuel Rail Pressure Sensor Internal Performance Enable No Fault Pending	Enabled when a code clear is not active or not exiting device control True U0625 P16E5 P128F	420 failures out of 525 samples 6.25 ms per Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Pressure &Temperature Sensor Temperature 1 Message Incorrect	P128C	This DTC diagnoses the the communication errors on the temperature 1 serial data channel	Serial Message 1 Age	>= 0.03 ms	SENT signal Serial waveform diagnostics enable SENT power up delay No Fault Active	True >=0.00 seconds U0625 P16E5	134 failures out of 167 samples 6.25 ms per sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Pressure & Temperature Sensor Temperature 2 Message Incorrect	P128D	This DTC diagnoses the the communication errors on the temperature 2 serial data channel	Serial Message 2 Age	>= 0.03 ms	SENT signal Serial waveform diagnostics enable SENT power up delay No Fault Active	True >=0.00 seconds U0625 P16E5	134 failures out of 167 samples 6.25 ms per sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SENT Fuel Rail Pressure & Temperature Sensor Pressure Message Incorrect	P128F	This DTC determines if there is any SENT signal waveform for discrepancies (i.e. too many pulse, too few pulse, clock shift). The SENT HWIO Determines message waveform fault (i.e.too many pulse, too few pulse, clock shift) and if the message age is too long.	SENT HWIO Determines message fault (i.e.too many pulse, too few pulse, clock shift) Message Age	= true > 1.69 ms	SENT signal Serial waveform diagnostics enable SENT power up delay No Fault Active on	True >= 0.00 seconds Enabled when a code clear is not active or not exiting device control U0625 P16E5	400 failures out of 500 samples 6.25 ms per sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Fuel Pump Speed Signal Incorrect	P129F	FTZM ERFS control samples back-Electromotive Force [EMF] for zero voltage-level crossings as a detection method to enable closed loop control brushless commutation. Back EMF is an electrical characteristic of the inactive phase of the 3-phase signal wherein only 2 phases are active at any moment. Brushless pump speed is inferred using rate of zero-crossings detection and number of motor pole-pairs. Speed is reported to the ECM as serial data every 10 millisecs. Diagnostic software [FABR ring] calculates the error between the commanded, arbitrated fuel pump speed [FCBR ring] and the FTZM sensed fuel pump speed. The error is filtered and evaluated against calibratable threshold limits to determine pass/fail status. Any failure that exists on the fuel pump output circuit (3 phases) will be manifested in a Fuel Pump Speed	Sensed Filtered Fuel Pump Speed Error	> Speed Error Low Threshold [Supporting Table] **P129F Threshold Low** OR < Speed Error High Threshold [Supporting Table] **P129F Threshold High**	a) Diagnostic is .. b) CAN Sensor Bus message $0CB_Available c) FABR Fuel Control Enable Fault Active d) Fuel Pmp Speed Command Alive Rolling Count and Checksum Error [CAN Bus B $0CE] [CFMR_b_FTZM_Cmd1_ARC_ChkErr] e) FABR Fuel Pump Ckt FA f) FABR Driver OverTemp FA g) Run_Crank input Voltage h) Sensor Bus Relay On j) CAN Sensor Bus message $0CB Data Fault [CFMR_b_FTZM_Info8_ARC_ChkErr] k) CAN Sensor Bus message $0CB Comm Fault [CFMR_b_FTZM_Info8_UcodeCmFA] l) Fuel Pmp Spd Command ARC and Checksum Comm Fault Code [CFMR_b_FTZM_Cmd1_UcodeCmFA] m) Timer - FABR Rising Edge Diagnostic Delay n) Timer - FABR Falling Edge Diagn Delay	a) Enabled b) == TRUE c) <> TRUE d) <> TRUE e) <> TRUE f) <> TRUE g) > 9.00 volts h) == TRUE j) <> TRUE k) <> TRUE l) <> TRUE m) > 2.25 seconds n) > 1.00 seconds	1 sample / 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Rationality Diagnostic fault. Reported fuel pump speed data will only be consumed in this same diagnostic.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Enable Circuit Performance [FTZM Brushed Motor Fuel Pump applications only]	P12A6	The purpose of the Fuel Pump Driver Control Module Enable Circuit Performance Diagnostic is to detect if the state of the fuel control enable circuit is valid. This is accomplished by comparing the Fuel Control Enable circuit voltage state [high or low] measured by the Fuel Pump Driver Control Module to the state of Fuel Control Enable signal in the ECM. When the measured state does not match the expected state, the fail counter increments.	Fuel Control Enable Circuit Voltage State (Fuel Pump Driver Control Module)	<> Fuel Control Enable State (ECM)	a) Diagnostic is ... b) Chassis Fuel Pres Sys Type configuration selection c) Serial Data message FTZM Information 2 ($CC) Alive Rolling Count Check Error d) Diagnostic serial data available (message $CC) e) Sensor Bus Relay On f1) Run_Crank Ignition Sw Position Active OR f2) Run_Crank Ignition Sw Position Active timer [delay]	a) Enabled b) == FCBR ECM [Gas or Diesel] FTZM [Brushed DC or Brushless DC pump] Sys c) <> True d) == TRUE e) == TRUE f1) <> True OR f2) >= 0.51 seconds	40 failures / 80 samples 1 sample / 12.5 millisec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Torque Solver Performance	P134C	The performance of internal control module torque solver is monitored by the reported status of the solver. The torque solver performance is only monitored if the solver is enabled.	Reported status by the torque solver is used to diagnose the solver. Depending on the status, an additional check to confirm numerical stability might be used to diagnose. The solver status could reflect any of the following cases:	For a Numerical Check, a failure will be recorded if the relevant internal solver values > 10,000.00			5.00 failures out of 8.00 samples sample time varies (~15-35ms)	Type B, 2 Trips
			(-5) solver terminates execution due to task overrun	Failure		Enabled		
			(-4) solver cannot terminate within given number of iterations due to numerical degradation	Failure		Enabled		
			(-3) solver falsely detects optimality due to numerical degradation	Failure		Enabled		
			(-2) solver cannot solve the problem within given number of iterations	Failure		Enabled		
			(-1) solver detects infeasibility	Failure		Enabled		
			(0) solver problem has no free manipulated variables so no problem is solved	Pass		Enabled		
			(1) solver detects optimality	Pass		Enabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			(2) solver cannot terminate within given number of iterations due to incorrect parameters	Numerical Check		Enabled		
			(3) solver falsely detects infeasibility due to incorrect parameters	Numerical Check		Enabled		
			(4) solver detects optimality while numerical degradation occurs	Numerical Check		Enabled		
			(5) solver falsely detects infeasibility due to numerical degradation	Numerical Check		Enabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ignition Coil Positive Voltage Circuit Group 1 * * SIDI ONLY * *	P135A	This diagnostic checks for minimum voltage at the fuse which supplies power to the Ignition Coils (applicable only for SIDI applications). A diagnostic failure indicates a blown fuse.	Ignition Module Supply Voltage.	< 2.5 Volts	Diagnostic Enabled? Three possible Ignition Coil Power Sources (only 1 used): Ignition Coil Power Source = <u>Case 1: Battery</u> Delay starting at Key-On <u>Case 2: Ignition Run/ Crank</u> Ignition Run/Crank Voltage <u>Case 3: PT Relay</u> PT Relay Voltage	Yes PT Relay (Case 3) 5 Engine Revs > 5.0 volts >11.0 volts	50 Failures out of 63 Samples 6.25 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve D Position Sensor Stop Performance (HEAT - BRV)	P1387	Performance Check This DTC checks for an invalid endstop learn. The valve is moved against each endstop. If the learned position is out of range a DTC will be set.	If any of the following conditions are met a failure will be recorded: Condition 1 (closed): Learned bypass valve position or and the learn has completed Condition 2 (open): Learned bypass valve position or and the learn has completed	>5.00 degrees <-8.00 degrees > 117.00 degrees < 102.00 degrees	Diagnostic is Enabled No DTCs Engine Diag System Bypass Valve Learn Engine Outlet Coolant OR OBD Coolant Enable Criteria Engine Outlet Coolant AND Engine Hot Light	EECR_EngineOutlet_FA BRV_HBridge_PstnSnsr_FA = Enabled = Successful or Inprogress > -39.00 °C = TRUE < 150.00 °C = Inactive	Within 60.00 seconds after engine shutdown.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Pressure High Control Circuit Low	P13B1	Controller specific output driver circuit diagnoses the oil pump high-sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	Short to Ground Circuit < 0.5 0 impedance between output and controller ground	Powertrain Relay Voltage Run/Crank Active Cranking State	> 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type A, 1 Trips Note: In certain controlle rs P06DA may also set (Oil Pump Control Circuit Open)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve E Position Sensor Stop Performance (HEAT - ORV)	P13F6	Performance Check This DTC checks for an invalid endstop learn. The valve is moved against each endstop. If the learned position is out of range a DTC will be set.	If any of the following conditions are met a failure will be recorded: Condition 1 (closed): Learned bypass valve position or and the learn has completed Condition 2 (open): Learned bypass valve position or and the learn has completed	>5.00 degrees <-8.00 degrees >212.00 degrees < 197.00 degrees	Diagnostic is Enabled No DTCs Engine Diag System Bypass Valve Learn Engine Outlet Coolant OR OBD Coolant Enable Criteria Engine Outlet Coolant AND Engine Hot Light	EECR_EngineOutlet_FA ORV_PstnSnsr_FA = Enabled = Successful or Inprogress > -39.00 °C = TRUE < 150.00 °C = Inactive	Within 60.00 seconds after engine shutdown.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Engine Coolant Bypass Valve E Range/ Performance (HEAT-ORV)	P13F7	This DTC will detect when the valve cannot achieve the desired position within a calibrated threshold (degrees (angle)) after the Target position has stabilized for a calibratable amount of time or is moving slower than a calibratable rate. A failure of this diagnostic would indicate a slow or stuck part.	Absolute position deviation between target and actual	> 12.00 Degrees	Diagnostic is Enabled Coolant system mode Catalyst Warmup Enabled No DTCs Closed Loop position control Desired Position Gradient is stable Valve anti-sticking routine Engine Diag System Engine not cranking Run Crank Ignition in Range Engine Outlet Coolant AND Engine Outlet Coolant is not faulted OR OBD Coolant Enable Criteria	 = Low Flow or Low Flow Autostop = TRUE EECR_EngineOutlet_FA 0 RV_PstnSnsr_FA = Active = TRUE = Inactive = Enabled = True = True > -39.00 °C = TRUE = TRUE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Engine Coolant Bypass Valve D Range/ Performance (HEAT-BRV)	P13FC	This DTC will detect when the valve cannot achieve the desired position within a calibrated threshold (degrees (angle)) after the Target position has stabilized for a calibratable amount of time or is moving slower than a calibratable rate. A failure of this diagnostic would indicate a slow or stuck part.	Absolute position deviation between target and actual	> 12.00 Degrees	Diagnostic is Enabled Coolant system mode Catalyst Warmup Enabled No DTCs Closed Loop position control Desired Position Gradient is stable Valve anti-sticking routine Engine Diag System Engine not cranking Run Crank Ignition in Range Engine Outlet Coolant AND Engine Outlet Coolant is not faulted OR OBD Coolant Enable Criteria	 = Low Flow or Low Flow Autostop = TRUE EECR_EngineOutlet_FA BRV_HBridge_PstnSnsr_FA = Active = TRUE = Inactive = Enabled = True = True > -39.00 °C = TRUE = TRUE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Emissions Reduction System Fault	P1400	Model based test computes power from exhaust flow and thermal energy resulting from elevated idle speed and retarded spark advance. Detects if the cold start emission reduction system has failed resulting in the delivered power being out of range.	Average desired accumulated exhaust power - Average actual accumulated exhaust power (too much energy delivered to catalyst) Average desired accumulated exhaust power - Average actual accumulated exhaust power (too little energy delivered to catalyst) (EWMA filtered) Average Power = output of **P1400_EngineSpeedResidual_Table** * output of **P1400_SparkResidual_Table** NOTE: Desired accumulated power would use the desired catalyst light off spark and desired engine speed and the actual accumuated power would use the final commanded spark and actual engine speed. Refer to the Supporting Tables for details	< -32.00 KJ/s (high RPM failure mode) > 23.00 KJ/s (low RPM failure mode)	To enable the diagnostic, the Cold Start Emission Reduction Strategy must be Active per the following: Catalyst Temperature AND Engine Coolant AND Engine Coolant AND Barometric Pressure The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following: Catalyst Temperature AND Engine Run Time OR Engine Run Time OR Barometric Pressure	< 500.00 degC > -12.00 degC <= 66.00 degC >= 72.00 KPa >= 800.00 degC >= 0.00 seconds > **P1400_CatalystLightOffExtendedEngineRunTimeExit** This Extended Engine run time exit is a function of percent ethanol and Catmons NormRatioEWMA. Refer to "Supporting Tables" for details. < 72.00 KPa	Runs once per trip when the cold start emission reduction strategy is active Frequency: 100ms Loop Test completes after 8 seconds of accumulated qualified data.	EWMA Based - Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Other Enable Criteria:			
					OBD Manufacturer Enable Counter	0		
					Vehicle Speed	<1.24MPH		
					Allow diagnostic to calculate residual in an off-idle state. If the value of the OffIdleEnable is equal to 1 then the "DriverOffAccelPedal" will not be checked. However, if the value of OffIdleEnable is 0 then driver must be off the accel pedal	0 (A value of 1 allows diagnostic to run and calculate the residual while off idle. A value of 0 requires calculation of the residual at idle)		
					A change in throttle position (tip-in/tip-out) will initiate a delay in the calculation of the average qualified residual value. Therefore when the:			
					Pedal Close Delay Timer	> 5.00 seconds		
					the diagnostic will continue the calculation.			
					A change in gear will initiate a delay in the calculation of the average qualified residual value to			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					allow time for the actual engine speed and actual final commanded spark to achieve their desired values. Therefore, when the:			
					Gear Shift Delay Timer	> 1.50 seconds		
					the diagnostic will continue the calculation			
					For Manual Transmission vehicles:			
					Clutch Pedal Position	> 5.00 %		
					Clutch Pedal Position	< 5.00 %		
					The diagnostic will delay calculation of the residual value and potentially weight the residual calculation differently based on engine run time. This is to ensure the diagnostic is operating in idle speed control as well as during the peak catalyst light off period.			
					The time weighting factor must be :	> 0 These are scalar values that are a function of engine run time. Refer to		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					General Enable: DTC's Not Set:	**P1400_ColdStartDiagnosticDelayBasedOnEngineRunTime** and the cal axis, **P1400_ColdStartDiagnosticDelayBasedOnEngineRunTimeCalAxis** in the "Supporting Tables" for details. AcceleratorPedalFailure ECT_Sensor_FA IAT_SensorCircuitFA MnfdTempSensorCktFP CrankSensor_FA FuelInjectorCircuit_FA MAF_SensorFA MAP_SensorFA EngineMisfireDetected_FA ClutchPstnSnsr FA IAC_SystemRPM_FA IgnitionOutputDriver_FA TPS_FA VehicleSpeedSensor_FA 5VoltReferenceMAP_OOR_Flt TransmissionEngagedState_FA EngineTorqueEstInaccurate		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level SensorA Reference Feedback Range/ Performance [For use on vehicles with FTZM]	P1434	This DTC will detect a fault in Primary fuel tank level sensor 5V reference by comparing DEC ECU commanded signal period and pulse width values against measured period and pulse width reported by the smart device	Reference Voltage 0 Period Error Maximum [Measured Ref V Period - Commanded Ref V Period]	> 25.00 millisec	a] CAN serial data available [$2D7] b] Calibration - Reference Voltage Command Source c] Timer - Reference Voltage Pulse Width Available Synchronization d] Timer - Reference Voltage Period Available Delay e] Diagnostic System Disabled f] FTZM Serial Data Info4 Rolling Counter Check Error g] Reference Voltage Performance 0 Diagnostic Enabled	a] –– True b] == ECM c] > 1.25 sec d] > 0.75 sec e] <> True f] <> True g] == TRUE	250 ms / sample	Type B, 2 Trips
			Reference Voltage 0 Pulse Width Error Maximum [Measured Ref V PW - Commanded Ref V PW]	> 1.50 millisec	a] CAN serial data available [$2D7] b] Calibration - Reference Voltage Command Source c] Timer - Reference Voltage Pulse Width Available Synchronization d] Timer - Reference Voltage Period Available Delay e] Diagnostic System Disabled	a] –– True b] == ECM c] > 1.25 sec d] > 0.75 sec e] <> True	250 ms / sample 16 Failures/ 20 Samples	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					f] FTZM Serial Data Info4 Rolling Counter Check Error g] Reference Voltage Performance 0 Diagnostic Enabled	f] <> True g] == TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor B Reference Feedback Range/ Performance [For use on vehicles with FTZM and Secondary Fuel Tank]	P143E	This DTC will detect a fault in Secondary fuel tank level sensor 5V reference by comparing DEC ECU commanded signal period and pulse width values against measured period and pulse width reported by the smart device	Reference Voltage 1 Period Error Maximum [Measured Ref V Period - Commanded Ref V Period]	> 25.00 millisec	a] CAN serial data available [$2D7] b] Calibration - Reference Voltage Command Source c] Timer - Reference Voltage Pulse Width Available Synchronization d] Timer - Reference Voltage Period Available Delay e] Diagnostic System Disabled f] FTZM Serial Data Info4 Rolling Counter Check Error g] Reference Voltage Performance 1 Diagnostic Enabled	a] –– True b] == ECM c] > 1.25 sec d] > 0.75 sec e] <> True f] <> True g] == TRUE	250 ms / sample 16 Failures/ 20 Samples	Type B, 2 Trips
			Reference Voltage 1 Pulse Width Error Maximum [Measured Ref V PW - Commanded Ref V PW]	> 1.50 millisec	a] CAN serial data available [$2D7] b] Calibration - Reference Voltage Command Source c] Timer - Reference Voltage Pulse Width Available Synchronization d] Timer - Reference Voltage Period Available Delay e] Diagnostic System Disabled	a] –– True b] == ECM c] > 1.25 sec d] > 0.75 sec e] <> True	250 ms / sample 16 Failures/ 20 Samples	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					f] FTZM Serial Data Info4 Rolling Counter Check Error g] Reference Voltage Performance 1 Diagnostic Enabled	f] <> True g] == TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump On Speed Performance	P1467	Purge pump speed does not match requested pump speed when pump is commanded on	Purge pump speed Purge pump speed	> refer to **Purge pump speed on value too high** in Supporting Tables. Calibration threshold for pump speed too high as func of pump supply voltage < refer to **Purge pump speed on value too low** in Supporting Tables. Calibration threshold for pump speed too low as func of pump supply voltage	Diagnostic is Enabled Propulsion system on Purge pump commanded on LIN data available for Outside Air Temp Powertrain relay voltage Barometric pressure Time delay Purge Pump Over Temperature Status No active DTCs	 > 2 counts >-20 °C >11.0 volts > 70 kPa > 14 seconds for purge pump speed to spool up (pump off to on) = False P1469 - Purge Pump Speed OOR Low P146A- Purge Pump Speed OOR High P148E - Purge Pump Voltage OOR Low P148F - Purge Pump Voltage OOR High P1490 - Purge Pump Voltage Performance P14A4-EVAP Purge Pump Temperature Too High	100 failures out of 125 samples 100 msec / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No pending DTC's	Purge Pump LIN Communication Fault Active AmbientAirDefault OAT_AmbientSensorFA P1469 - Purge Pump Speed OOR Low P146A- Purge Pump Speed OOR High Purge Pump LIN Communication Fault Pending		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Off Speed Performance	P1468	Purge pump speed does not match requested pump speed when pump is commanded off	Absolute value of purge pump speed	> 240 RPM	Diagnostic is Enabled Propulsion system on Purge pump commanded off LIN data available for Powertrain relay voltage Time delay No active DTCs No pending DTCs	 > 2 counts >11.0 volts > 21 seconds for purge pump speed to spool up (pump on to off) P1469 - Purge Pump Speed OOR Low Fault Active P146A- Purge Pump Speed OOR High Fault Active P148E - Purge Pump Voltage OOR Low P148F - Purge Pump Voltage OOR High P1490 - Purge Pump Voltage Performance Purge Pump LIN Communication Fault Active P1469 - Purge Pump Speed OOR Low P146A- Purge Pump Speed OOR High	50 failures out of 63 samples 100 msec / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						Purge Pump LIN Communication Fault Pending		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Speed Too Low	P1469	Purge pump speed signal is out of range low	Purge pump speed	< -100RPM	Diagnostic is Enabled LIN data available for Powertrain relay voltage No active DTCs No pending DTCs	 >2 counts >11.0 volts P148E - Purge Pump Voltage OOR Low P148F - Purge Pump Voltage OOR High P1490 - Purge Pump Voltage Performance Purge Pump LIN Communication Fault Active Purge Pump LIN Communication Fault Pending	50 failures out of 63 samples 100 msec / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Speed Too High	P146A	Purge pump speed signal is out of range high	Purge pump speed	> 55,000 RPM	Diagnostic is Enabled LIN data available for Powertrain relay voltage No active DTCs No pending DTCs	 > 2 counts >11.0 volts P148E - Purge Pump Voltage OOR Low P148F - Purge Pump Voltage OOR High P1490 - Purge Pump Voltage Performance Purge Pump LIN Communication Fault Active Purge Pump LIN Communication Fault Pending	50 failures out of 63 samples 100 msec / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump System Performance (Continuous Flow Version)	P146B	Purge pump system flow performance, based on pressure sensor feedback, is too low or too high. A purge system, that employs a purge pump, will monitor the purge flow delivery through the evaporative emission system. The estimated purge flow is calculated as a function of pressure across the purge solenoid valve. The failure threshold purge flow is calculated as a function of purge valve duty cycle and barometric pressure. The ratio of the estimated purge flow and failure threshold purge flow is calculated and compared to a threshold. A fault pending is set when the calculated ratio is greater than or less than calibration thresholds. These fault pending states are processed by X out of Y logic.	Purge pump flow ratio low Purge pump flow ratio low = estimated purge flow as a function of pressure across purge solenoid valve / failure threshold for purge low flow as a function of purge valve duty cycle and barometric pressure Purge pump flow ratio high Purge pump flow ratio high = estimated purge flow as a function of pressure across purge solenoid valve / failure threshold for purge high flow as a function of purge valve duty cycle and barometric pressure	< refer to **Purge pump performance low flow ratio threshold** in Supporting Tables. Calibration threshold for performance too low as func of purge valve duty cycle and barometric pressue > refer to **Purge pump performance high flow ratio threshold** in Supporting Tables. Calibration threshold for performance too high as func of purge valve duty cycle and barometric pressure	Diagnostic is Enabled Propulsion system on Conditions for Estimated Ambient Temperature Using OAT Sensor to be Valid (read description for details) Outside Air Temperature Outside Air Temperature Barometric Pressure Pump speed on timer No device control Averaging of pump pressure sensor reading is valid Purge is enabled EVAP diagnostics are not running (This means purge valve leak (P0496), large leak (P0455), and canister vent restriction (P0446) diagnostics have completed or did not need to run) and delay timer LIN data available for LIN IAT data available Powertrain relay voltage	= TRUE > 0 °C < 50 °C > 70 kPa > 14 seconds = TRUE = TRUE > 5.0 Seconds > 2 counts >11.0 volts	80 failures out of 100 samples 100 msec / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					**********	**********		
					When entering or re-entering the enable criteria in this section a delay timer needs to expire	> 1.0 Seconds		
					Engine RPM to enable	400 RPM <X< 6,800 RPM		
					Engine RPM to remain enabled	350 RPM <X< 6,850 RPM		
					Engine airlow to enable	0 g/s <X< 30 g/s		
					Engine airlow to remain enabled	-5 g/s <X< 35 g/s		
					Purge solenoid DC to enable	5<X<101 %		
					Purge solenoid DC to remain enabled	2<X<104%		
					Purge gas flow ratio to enable	**Purge System Low Purge Flow Enable** <X< **Purge System High Purge Flow Enable** in Supporting Tables.		
					Purge gas flow ratio to remain enabled	**Purge System Low Purge Flow Remain Enabled** <X< **Purge System High Purge Flow Remain Enabled** in Supporting Tables.		
					Purge flow to enable	0.0 <X< 1.5 g/s		
					Purge flow to remain enabled	-0.1 <X< 1.6 g/s		
					Induction vacuum to			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					enable Induction vacuum to remain enabled Vehicle Speed to enable Vehicle Speed to remain enabled IAT to enable IAT to remain enabled Purge DC change per 100 ms loop to enable Purge DC change per 100 ms loop to remain enable ********** No active DTCs	<0.3 kPa <0.5 kPa >3.1 mph >1.9mph 0.0 <X< 100.00 deg C -5.0 <X< 105.00 deg C X< 5.0 % X< 6.0 % ********** P1467- EVAP Purge Pump On Speed Performance P1469 - Purge Pump Speed OOR Low P146A- Purge Pump Speed OOR High P146D - Purge Pump Pressure Sensor OOR Low P146E - Purge Pump Pressure Sensor OOR High P146F - Purge Pump Pressure Sensor Performance P148E - Purae Pumo		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No pending DTC's	Voltage OOR Low P148F - Purge Pump Voltage OOR High P1490 - Purge Pump Voltage Performance P14A4-EVAP Purge Pump Temperature Too High Purge Pump LIN Communication Fault Active AmbientAirDefault ConvVenting_FA ConvPurgeCkt_FA VehicleSpeedSensor_FA OAT_EstAmbTemp_FA IAT_SensorFA P14A4-EVAP Purge Pump Temperature Too High Purge Pump LIN Communication Fault Pending IAT_SensorFA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump System Misassembled	P146C	Purge pump pressure is too low for a given pump speed with the purge valve commanded closed. Detects a disconnected hose between the purge pump and purge valve.	Average Purge Pump Pressure Reading - Initial Purge Pump Pressure Reading Readings are averaged for 5 seconds.	 **Purge Pump Misassembled Failure Threshold** * (times) **Purge Pump Diagnostic IAT Multiplier Factor** both in Supporting Tables Calibration threshold (kPa) as a func of (Average Purge Pump Speed and barometric pressure) * IAT multiplier factor (unitless) as a func of IAT	Diagnostic is Enabled Purge duty cycle is commanded to zero Purge pump commanded on Engine running LIN data available for LIN IAT data available Powertrain relay voltage Barometric pressure Purge pump initial speed Outside Air Temperature Initial average purge pump pressure calculated and in range Outside air temperature No device control Pump spool up time delay Allow test time Purge pump over temperature status Initial pump speed capture period	 >2 counts >11.0 volts >70 kPa <240 RPM -20°C<X<50°C -3 kPa <X<13kPA >0°C (only if pressure sensor is not in the range of -3 kPa <X<13kPA) >7 seconds <36 seconds = FALSE >4 counts	Once per trip	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Purge pump speed No active DTCs	>35,000 RPM P1467- EVAP Purge Pump On Speed Performance P1469 - Purge Pump Speed OOR Low P146A- Purge Pump Speed OOR High P146D - Purge Pump Pressure Sensor OOR Low P146E - Purge Pump Pressure Sensor OOR High P146F - Purge Pump Pressure Sensor Performance P148E - Purge Pump Voltage OOR Low P148F - Purge Pump Voltage OOR High P1490 - Purge Pump Voltage Performance P14A4-EVAP Purge Pump Temperature Too High Purge Pump LIN Communication Fault Active AmbientAirDefault OAT_AmbientSensorFA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No pending DTC's	ConvPurgeCkt_FA IAT_SensorFA ECT_Sensor_FA P1469 - Purge Pump Speed OOR Low P146A- Purge Pump Speed OOR High P146D - Purge Pump Pressure Sensor OOR Low P146E - Purge Pump Pressure Sensor OOR High Purge Pump LIN Communication Fault Pending IAT_SensorFA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Pressure Sensor Circuit Low Voltage	P146D	This DTC will detect a Purge Pump Pressure sensor signal that is too low out of range. The Purge Pump Pressure sensor circuit out of range diagnostic compares the raw sensor % of 5 V ref to a lower threshold. It is an X out of Y diagnostic that runs continuously anytime the controller is awake. If the sensor % of 5 V ref is below the lower threshold, the low fail counter then increments. If the low fail counter reaches its threshold then a fail is reported for P146D DTC. A pass is reported for P146D DTC if the low sample counter reaches its threshold.	Purge pump pressure sensor signal The normal operating range of the purge pump pressure sensor is 0.5 volts (~ -6000 Pa) to 4.5 volts (~ 26000 Pa).	<3.0% of 5Vref(0.1V or -8,800 Pa)	Diagnostic is 1.00		1,280 failures out of 1,600 samples 6.25 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Pressure Sensor Circuit High Voltage	P146E	This DTC will detect a Purge Pump Pressure sensor signal that is too high out of range. The Purge Pump Pressure sensor circuit out of range diagnostic compares the raw sensor % of 5 V ref to a upper threshold. It is an X out of Y diagnostic that runs continuously anytime the controller is awake. If the sensor % of 5 V ref is above the upper threshold, the high fail counter then increments. If the high fail counter reaches its threshold then a fail is reported for P146E DTC. A pass is reported for P146E DTC if the high sample counter reaches its threshold.	Purge pump pressure sensor signal The normal operating range of the purge pump pressure sensor is 0.5 volts (~ -6000 Pa) to 4.5 volts (~ 26000 Pa).	>97.0% of 5 Vref (4.9 V or 28,800 Pa	Diagnostic is 1.00		1,280 failures out of 1,600 samples 6.25 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Pressure Sensor Performance	P146F	Purge pump pressure sensor offset pressure is out of range when sensor re-zero occurs. The DTC will be set if the purge pump pressure sensor offset is out of range when it tries to re-zero at the beginning of a cold start drive cycle. The re-zero test determines if the purge pump pressure sensor signal falls within a calibratable window about atmospheric pressure. The results of the re-zero test are used to determine if there is a re-zero problem. 1) An individual re-zero test generates a re-zero ratio. The ratio goes from 0.0 to 1.0. 2) A 0.0 means that the re-zero pressure signal achieved exactly the previous learned offset. 3) A ratio of 1.0 means that the re-zero pressure did not get within the window. 4) Re-zero pressure within the window generates values between 0.0 and 1.0.	The purge pump pressure sesnor signal is compared to a window about barometric pressure (sensor voltage offset (-1.25 volts)) Upper pressure threshold (pressure addition above the nominal barometric pressure) The learned delta above the previous learned offset needs to be Lower pressure threshold (pressure subtraction below the nominal barometric pressure) The learned delta below the previous learned offset needs to be The difference between purge pump pressure sensor signal and the previous learned offset is then normalized against the appropriate threshold listed above to produce a ratio between 0.0 and 1.0. This normalized re-zero ratio is then filtered with a EWMA (with 0= perfect pass and 1=perfect fail). When EWMA is the DTC light is	0.96 kPa rezero max < 1.68 kPa delta max -0.96 kPa rezero min >-1.68 kPa delta min > 0.73 (EWMA Fail Threshold),	Diagnostic is Enabled Soak timer Power up coolant temperature Barometric pressure Engine not cranking Power up IAT Power up IAT LIN IAT data available Power Up Coolant temp - Power Up IAT temp Average purge pump pressure calculated No Active DTC's No Pending DTC's	>3,600 seconds <35 °C >70 kPa >4 °C <35 °C <8 °C P146D - Purge Pump Pressure Sensor OCR Low Fault Active P146E - Purge Pump Pressure Sensor OCR High Fault Active IAT_SensorFA ECT_Sensor_FA EngineModeNotRunTimer_FA AmbientAirDefault P146D - Purge Pump Pressure Sensor OCR Low Fault Active P146E - Purge Pump Pressure Sensor OCR High Fault Active	100 ms	Type A, 1 Trips EWMA Average run length: 6 Run length is 2 trips after code clear

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		The resulting re-zero ratio is filtered using an exponentially weighted moving average (EWMA). When the EWMA exceeds a fail threshold, the purge pump pressure sensor signal re-zero test reports a failure. Once the purge pump pressure sensor signal re-zero test fails, the EWMA fall below a lower re-pass threshold before it can pass the purge pump pressure sensor signal re-zero test again.	illuminated. The EWMA calculation uses a 0.20 weighting coefficient. The DTC light can be turned off if the EWMA is and stays below the EWMA fail threshold for 3 additional consecutive trips.	<0.40 (EWMA Re-Pass Threshold				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Voltage Sensor Circuit Low	P148E	This DTC will detect a purge pump voltage sensor signal that is out of range low (short to ground or open circuit). The purge pump voltage sensor signal out of range diagnostic compares the voltage sensor signal reading to a lower voltage threshold. It is an X out of Y diagnostic that runs continuously anytime the controller is awake. If the voltage sensor signal reading is below the lower voltage threshold, the low fail counter then increments. If the low fail counter reaches its threshold then a fail is reported for P148E DTC. A pass is reported for P148E DTC if the low sample counter reaches its threshold.	Purge pump voltage sensor reading	<3.5 volts	Diagnostic is Enabled LIN data available for Powertrain relay voltage No active DTCs Np pending DTCs	>2 counts >11.0 volts Purge Pump LIN Communication Fault Active Purge Pump LIN Communication Fault Pending	50 failures out of 63 samples 100 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Voltage Sensor Circuit High	P148F	This DTC will detect a purge pump voltage sensor signal that is out of range high (short to power). The purge pump voltage sensor signal out of range diagnostic compares the voltage sensor signal reading to a upper voltage threshold. It is an X out of Y diagnostic that runs continuously anytime the controller is awake. If the voltage sensor signal reading is above the upper voltage threshold, the low fail counter then increments. If the low fail counter reaches its threshold then a fail is reported for P148F DTC. A pass is reported for P148F DTC if the low sample counter reaches its threshold.	Purge pump voltage sensor reading	>28.0 volts	Diagnostic is Enabled LIN data available for Powertrain relay voltage No active DTCs Np pending DTCs	 > 2 counts >11.0 volts Purge Pump LIN Communication Fault Active Purge Pump LIN Communication Fault Pending	50 failures out of 63 samples 100 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Voltage Sensor Performance	P1490	This diagnostic fails when the difference between purge pump voltage sensor reading and powertrain relay voltage reading is too large.	Absolute value of (Purge pump voltage sensor - powertrain relay voltage)	>2.0 volts	Diagnostic is Enabled Propulsion system on Powertrain relay voltage Engine not cranking Voltage stabilization delay time after engine crank (> 2 seconds) LIN data available for No Active DTC's No Pending DTC's	 >11.0 volts > 2.0 seconds > 2 counts P148E - Purge Pump Voltage OOR Low P148F - Purge Pump Voltage OOR High Purge Pump LIN Communication Fault Active P148E - Purge Pump Voltage OOR Low P148F - Purge Pump Voltage OOR High Purge Pump LIN Communication Fault Pending	80 failures out of 100 samples 100 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 2 Not Plausible (HEAT)	P149A	This DTC detects either a biased high or low temperature sensor. This is done by comparing this sensor with two other temperature sensors.	This sensor is compared to two other sensors for this diagnostic to function. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr2 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6 The comparison sensors, temperature thresholds, and aux heater effects can be looked up by finding the location associated with the		Diagnostic is Enabled No Active DTC's Propulsion system Inactive timer error Sensor under diagnosis is not faulted Used comparison sensors are not currently faulted: - BiasChkCylHdCIntSnsr - BiasChkBlockCIntSnsr - BiasChkEngInCIntSnsr - BiasChkEngOutCIntSnsr - BiasChkHtrCrInCIntSnsr - BiasChkHtrCrOutCInSnsr - BiasChkRadOutCIntSnsr - BiasChkBypInCIntSnsr - BiasChkEngMetalSnsr - BiasChkIntakeAirSnsr - BiasChkHumTmpSnsr - BiasChkManfldAirSnsr - BiasChkOutsideAirSnsr - BiasChkEngOilSnsr - BiasChk_EGR_UpStrmSn sr - BiasChk_EGR_DwnStmS	OAT_PtEstFiltFA PSAR_PropSyslnactveCr s_FA = FALSE EECR_TS2_CktFA EECR_CylHeadCoolant_ CktFA EECR_BlockCoolant_Ckt FA EECR_Enginelnlet_CktFA EECR_EngineOutlet_Ckt FA EECR_HeaterCorelnlet_C ktFA EECR_HeaterCoreOutlet _CktFA EECR_RadiatorOutlet_Ck tFA EECR_Bypasslnlet_CktF A EECR_CylHeadMetal1_C ktFA IAT_SensorFA HumTempSnsrFA MnfdTempSensorFA OAT_AmbientSensorFA EngOilTempFA EGRTempSensorUPSS_F A	1 failure to set DTC 1 sec/ sample Once per valid cold start	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			physical (Temperature) sensor number. **Engine Block:** CeEECR_e_PhysSnsr7 Comparison sensor 1: CeEECR_e_BiasChkCylHdCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkEngOilSnsr Block Heater: CeEECR_e_AuxHeaterBiasHigh Threshold A: Threshold B: **Engine Inlet:** CeEECR_e_PhysSnsr2 Comparison sensor 1: CeEECR_e_BiasChkBlockClntSnsr Comparison sensor 2: CeEECR_e_BiasChkRadOutCIntSnsr Block Heater: CeEECR_e_AuxHeaterBiasLow Threshold A: Threshold B: **Head Coolant:** CeEECR_e_PhysSnsr6 Comparison sensor 1: CeEECR_e_BiasChkBlockClntSnsr Comparison sensor 2: CeEECR_e_BiasChkEngInCIntSnsr Block Heater:	15.77 °C 7.45 °C	nsr - BiasChk_EGR_LowPrsSnsr - BiasChkFuelSnsr - BiasChk_EGRCoolerOutlet Comparison sensors ========== The following thresholds are based on the sensor under diagnosis **Engine Block:** Propulsion Off Soak Time Ambient Air Temperature **Engine Inlet:** Propulsion Off Soak Time Ambient Air Temperature **Head Coolant:** Propulsion Off Soak Time Ambient Air Temperature **Radiator Outlet:** Propulsion Off Soak Time Ambient Air Temperature ========== Comparison sensor 1 & 2 are not ========== Aux Heat Detection	EGRTempSensorDNSS_FA LPE_TempSnsrFA HRTR_b_FuelSensor_FA_Bndl EECR_EGRCoolerOutletCoolant_FA = Availible >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CeEECR_e_AuxHeaterBiasBoth Threshold A: Threshold B: **Radiator Outlet:** CeEECR_e_PhysSnsr3 Comparison sensor 1: CeEECR_e_BiasChkEngInCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkBlockCIntSnsr Block Heater: CeEECR_e_AuxHeaterBiasLow Threshold A: Threshold B: A failure will be reported if any of the following conditions are met. Evaluated in order: 1) This sensor is above both comparison sensors 2) This sensor is below both comparison sensors 3) This sensor is above both comparison sensors and an aux heat source has not been detected to cause this skew 4) This sensor is below both comparison	11.15°C 8.66 °C 16.20 °C 7.55 °C	Aux heat detection can only be enabled the following are met: No Active DTCs At power-up a warm sensor and cool sensor are compared Warm sensor Cool sensor If the warm sensor is compared to the cool sensor Propulsion Off Soak Time Engine Off Soak Time Ambient Air Temperature There are 4 different types of aux heater detection for this application: 2x2 signature Absolute Drop IAT Drop Temperature Derivative **2x2 Signature Criteria:** The warm sensors Sensor 1: Sensor 2:	= CeEECR_e_BiasChkNoSelection Same set as listed above and EngineModeNotRunTimerError EngineModeNotRunTimer_FA VehicleSpeedSensor_FA CeAEHR_e_BlkHtrBlockClntSnsr CeAEHR_e_BlkHtrRadOutCIntSnsr >10.00 °C >21,600 seconds >21,600 seconds >-20.00 °C Enabled Enabled Disabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			sensors and an aux heat source has not been detected to cause this skew			Disabled		
					The cool sensors Sensor 1:			
					Sensor 2:	CeAEHR_e_BlkHtrBlock ClntSnsr CeAEHR_e_BlkHtrCylHd ClntSnsr		
					A block heater will be detected if the warm sensors are within AND The cool sensors are within AND The delta between the two groups (warm/cold)	CeAEHR_e_BlkHtrRadO utCIntSnsr CeAEHR_e_BlkHtrIntake AirSnsr 8.0 °C		
					Absolute Drop Criteria: The is monitored for a drop.	5.0 °C		
					The drop will be monitored for once coolant flow is AND Flow time is between AND either Engine runtime is OR Insufficent coolant flow is	>9.0 °C CeAEHR_e_BlkHtrBlock ClntSnsr		
				11.14°C 10.32 °C	present for	>2.00 L/min		
					A block heater is detected if a drop is	0.1 -18.0 seconds < 78.0 seconds		
					IAT Drop Criteria: The sensor will be used as IAT for this method	>300.0 seconds		
				>A °C	A block heater will be detected if:	>1.8 °C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				>A°C >B°C >B°C	IAT has a drop of during a drive defined by: Drive time Vehicle speed Addtional drive time is provided when vehicle speed drops below above threshold as follows This detection method will abort if the engine is off OR Engine runtime **Temperature Derivative Criteria:** Derivative will be monitored using Derivative will be monitored once coolant flow is AND Flow time is between AND either Engine runtime is OR Insufficent coolant flow is present for Derivative count will increment if derivative is If counts are a block heater is detected ==========	CeAEHR_e_BlkHtrIntake AirSnsr >5.0°C >400.0 seconds >24.0kph 0.5 times the seconds with vehicle speed below the threshold above > 180.0 seconds > 1,800 seconds CeAEHR_e_BlkHtrBlock ClntSnsr >-1.00 L/min 5.0 -15.0 seconds < 75.0 seconds >300.0 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						<-0.10°C/sec > 4 counts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 5 Not Plausible (HEAT)	P149D	This DTC detects either a biased high or low temperature sensor. This is done by comparing this sensor with two other temperature sensors.	This sensor is compared to two other sensors for this diagnostic to function. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr5 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6 The comparison sensors, temperature thresholds, and aux heater effects can be looked up by finding the location associated with the		Diagnostic is Enabled No Active DTCs Propulsion system Inactive timer error Sensor under diagnosis is not faulted Used comparison sensors are not currently faulted: - BiasChkCylHdCIntSnsr - BiasChkBlockCIntSnsr - BiasChkEngInCIntSnsr - BiasChkEngOutCIntSnsr - BiasChkHtrCrInCIntSnsr - BiasChkHtrCrOutCInSnsr - BiasChkRadOutCIntSnsr - BiasChkBypInCIntSnsr - BiasChkEngMetalSnsr - BiasChkIntakeAirSnsr - BiasChkHumTmpSnsr - BiasChkManfldAirSnsr - BiasChkOutsideAirSnsr - BiasChkEngOilSnsr - BiasChk_EGR_UpStrmSnsr - BiasChk_EGR_DwnStmS	OAT_PtEstFiltFA PSAR_PropSyslnactveCrs_FA = FALSE EECR_TS5_CktFA EECR_CylHeadCoolant_CktFA EECR_BlockCoolant_CktFA EECR_EngineInlet_CktFA EECR_EngineOutlet_CktFA EECR_HeaterCoreInlet_CktFA EECR_HeaterCoreOutlet_CktFA EECR_RadiatorOutlet_CktFA EECR_BypassInlet_CktFA EECR_CylHeadMetal1_CktFA IAT_SensorFA HumTempSnsrFA MnfdTempSensorFA OAT_AmbientSensorFA EngOilTempFA EGRTempSensorUPSS_FA	1 failure to set DTC 1 sec/ sample Once per valid cold start	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			physical (Temperature) sensor number. : **Engine Block:** CeEECR_e_PhysSnsr7 Comparison sensor 1: CeEECR_e_BiasChkCyl HdCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkEng OilSnsr Block Heater: CeEECR_e_AuxHeaterBi asHigh Threshold A: Threshold B: **Engine Inlet:** CeEECR_e_PhysSnsr2 Comparison sensor 1: CeEECR_e_BiasChkBlo ckClntSnsr Comparison sensor 2: CeEECR_e_BiasChkRad OutCIntSnsr Block Heater: CeEECR_e_AuxHeaterBi asLow Threshold A: Threshold B: **Head Coolant:** CeEECR_e_PhysSnsr6 Comparison sensor 1: CeEECR_e_BiasChkBlo ckClntSnsr Comparison sensor 2: CeEECR_e_BiasChkEng InCIntSnsr Block Heater:	15.77 °C 7.45 °C	nsr - BiasChk_EGR_LowPrsSn sr - BiasChkFuelSnsr - BiasChk_EGRCoolerOutl et Comparison sensors ========== The following thresholds are based on the sensor under diagnosis **Engine Block:** Propulsion Off Soak Time Ambient Air Temperature **Engine Inlet:** Propulsion Off Soak Time Ambient Air Temperature **Head Coolant:** Propulsion Off Soak Time Ambient Air Temperature **Radiator Outlet:** Propulsion Off Soak Time Ambient Air Temperature ========== Comparison sensor 1 & 2 are not ========== Aux Heat Detection	EGRTempSensorDNSS_F A LPE_TempSnsrFA HRTR_b_FuelSensor_FA _Bndl EECR_EGRCoolerOutlet Coolant_FA = Availible >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C =		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CeEECR_e_AuxHeaterBiasBoth Threshold A: Threshold B: **Radiator Outlet:** CeEECR_e_PhysSnsr3 Comparison sensor 1: CeEECR_e_BiasChkEngInCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkBlockCIntSnsr Block Heater: CeEECR_e_AuxHeaterBiasLow Threshold A: Threshold B: A failure will be reported if any of the following conditions are met. Evaluated in order: 1) This sensor is above both comparison sensors 2) This sensor is below both comparison sensors 3) This sensor is above both comparison sensors and an aux heat source has not been detected to cause this skew 4) This sensor is below both comparison	11.15°C 8.66 °C 16.20 °C 7.55 °C	Aux heat detection can only be enabled the following are met: No Active DTCs At power-up a warm sensor and cool sensor are compared Warm sensor Cool sensor If the warm sensor is compared to the cool sensor Propulsion Off Soak Time Engine Off Soak Time Ambient Air Temperature There are 4 different types of aux heater detection for this application: 2x2 signature Absolute Drop IAT Drop Temperature Derivative **2x2 Signature Criteria:** The warm sensors Sensor 1: Sensor 2:	CeEECR_e_BiasChkNoSelection Same set as listed above and EngineModeNotRunTimerError EngineModeNotRunTimer_FA VehicleSpeedSensor_FA CeAEHR_e_BlkHtrBlockClntSnsr CeAEHR_e_BlkHtrRadOutCIntSnsr >10.00 °C >21,600 seconds >21,600 seconds >-20.00 °C Enabled Enabled Disabled Disabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			sensors and an aux heat source has not been detected to cause this skew					
					The cool sensors Sensor 1: Sensor 2:	CeAEHR_e_BlkHtrBlock ClntSnsr CeAEHR_e_BlkHtrCylHd ClntSnsr		
					A block heater will be detected if the warm sensors are within AND The cool sensors are within AND The delta between the two groups (warm/cold)	CeAEHR_e_BlkHtrRadO utCIntSnsr CeAEHR_e_BlkHtrIntake AirSnsr 8.0 °C		
					Absolute Drop Criteria: The is monitored for a drop. The drop will be monitored for once coolant flow is AND Flow time is between AND either Engine runtime is OR Insufficent coolant flow is present for	5.0 °C >9.0 °C CeAEHR_e_BlkHtrBlock ClntSnsr >2.00 L/min 0.1 -18.0 seconds		
				11.14°C 10.32 °C	A block heater is detected if a drop is	< 78.0 seconds		
					IAT Drop Criteria: The sensor will be used as IAT for this method	>300.0 seconds >1.8 °C		
				>A °C	A block heater will be			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					detected if:	CeAEHR_e_BlkHtrIntake AirSnsr		
				>A°C	IAT has a drop of during a drive defined by: Drive time Vehicle speed			
				>B°C	Addtional drive time is provided when vehicle speed drops below above threshold as follows	>5.0°C >400.0 seconds >24.0kph		
				>B°C	This detection method will abort if the engine is off OR Engine runtime	0.5 times the seconds with vehicle speed below the threshold above		
					Temperature Derivative Criteria: Derivative will be monitored using	> 180.0 seconds > 1,800 seconds		
					Derivative will be monitored once coolant flow is AND Flow time is between AND either Engine runtime is OR Insufficent coolant flow is present for	CeAEHR_e_BlkHtrBlock ClntSnsr >-1.00 L/min 5.0 -15.0 seconds		
					Derivative count will increment if derivative is	< 75.0 seconds		
					If counts are a block heater is detected ==========	>300.0 seconds <-0.10°C/sec		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						> 4 counts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 6 Not Plausible (HEAT)	P149E	This DTC detects either a biased high or low temperature sensor. This is done by comparing this sensor with two other temperature sensors.	This sensor is compared to two other sensors for this diagnostic to function. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr6 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6 The comparison sensors, temperature thresholds, and aux heater effects can be looked up by finding the location associated with the		Diagnostic is Enabled No Active DTC's Propulsion system Inactive timer error Sensor under diagnosis is not faulted Used comparison sensors are not currently faulted: - BiasChkCylHdCIntSnsr - BiasChkBlockCIntSnsr - BiasChkEngInCIntSnsr - BiasChkEngOutCIntSnsr - BiasChkHtrCrInCIntSnsr - BiasChkHtrCrOutCInSnsr - BiasChkRadOutCIntSnsr - BiasChkBypInCIntSnsr - BiasChkEngMetalSnsr - BiasChkIntakeAirSnsr - BiasChkHumTmpSnsr - BiasChkManfldAirSnsr - BiasChkOutsideAirSnsr - BiasChkEngOilSnsr - BiasChk_EGR_UpStrmSnsr - BiasChk_EGR_DwnStmS	OAT_PtEstFiltFA PSAR_PropSyslnactveCrs_FA = FALSE EECR_TS6_CktFA EECR_CylHeadCoolant_CktFA EECR_BlockCoolant_CktFA EECR_EngineInlet_CktFA EECR_EngineOutlet_CktFA EECR_HeaterCoreInlet_CktFA EECR_HeaterCoreOutlet_CktFA EECR_RadiatorOutlet_CktFA EECR_BypassInlet_CktFA EECR_CylHeadMetal1_CktFA IAT_SensorFA HumTempSnsrFA MnfdTempSensorFA OAT_AmbientSensorFA EngOilTempFA EGRTempSensorUPSS_FA	1 failure to set DTC 1 sec/ sample Once per valid cold start	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			physical (Temperature) sensor number. **Engine Block:** CeEECR_e_PhysSnsr7 Comparison sensor 1: CeEECR_e_BiasChkCylHdCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkEngOilSnsr Block Heater: CeEECR_e_AuxHeaterBiasHigh Threshold A: Threshold B: **Engine Inlet:** CeEECR_e_PhysSnsr2 Comparison sensor 1: CeEECR_e_BiasChkBlockClntSnsr Comparison sensor 2: CeEECR_e_BiasChkRadOutCIntSnsr Block Heater: CeEECR_e_AuxHeaterBiasLow Threshold A: Threshold B: **Head Coolant:** CeEECR_e_PhysSnsr6 Comparison sensor 1: CeEECR_e_BiasChkBlockClntSnsr Comparison sensor 2: CeEECR_e_BiasChkEngInCIntSnsr Block Heater:	15.77 °C 7.45 °C	nsr - BiasChk_EGR_LowPrsSnsr - BiasChkFuelSnsr - BiasChk_EGRCoolerOutlet Comparison sensors ========== The following thresholds are based on the sensor under diagnosis **Engine Block:** Propulsion Off Soak Time Ambient Air Temperature **Engine Inlet:** Propulsion Off Soak Time Ambient Air Temperature **Head Coolant:** Propulsion Off Soak Time Ambient Air Temperature **Radiator Outlet:** Propulsion Off Soak Time Ambient Air Temperature ========== Comparison sensor 1 & 2 are not ==========	EGRTempSensorDNSS_FA LPE_TempSnsrFA HRTR_b_FuelSensor_FA_Bndl EECR_EGRCoolerOutletCoolant_FA = Availible >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C >28,800 seconds >-20.0 °C =		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			CeEECR_e_AuxHeaterBiasBoth Threshold A: Threshold B: **Radiator Outlet:** CeEECR_e_PhysSnsr3 Comparison sensor 1: CeEECR_e_BiasChkEngInCIntSnsr Comparison sensor 2: CeEECR_e_BiasChkBlockCIntSnsr Block Heater: CeEECR_e_AuxHeaterBiasLow Threshold A: Threshold B: A failure will be reported if any of the following conditions are met. Evaluated in order: 1) This sensor is above both comparison sensors 2) This sensor is below both comparison sensors 3) This sensor is above both comparison sensors and an aux heat source has not been detected to cause this skew 4) This sensor is	11.15°C 8.66 °C 16.20 °C 7.55 °C	Aux Heat Detection Aux heat detection can only be enabled the following are met: No Active DTCs At power-up a warm sensor and cool sensor are compared Warm sensor Cool sensor If the warm sensor is compared to the cool sensor Propulsion Off Soak Time Engine Off Soak Time Ambient Air Temperature There are 4 different types of aux heater detection for this application: 2x2 signature Absolute Drop IAT Drop Temperature Derivative **2x2 Signature Criteria:** The warm sensors Sensor 1:	CeEECR_e_BiasChkNoSelection Same set as listed above and EngineModeNotRunTimerError EngineModeNotRunTimer_FA VehicleSpeedSensor_FA CeAEHR_e_BlkHtrBlockClntSnsr CeAEHR_e_BlkHtrRadOutCIntSnsr >10.00 °C >21,600 seconds >21,600 seconds >-20.00 °C Enabled Enabled Disabled Disabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			below both comparison sensors and an aux heat source has not been detected to cause this skew		Sensor 2: The cool sensors Sensor 1: Sensor 2: A block heater will be detected if the warm sensors are within AND The cool sensors are within AND The delta between the two groups (warm/cold) **Absolute Drop Criteria:** The is monitored for a drop. The drop will be monitored for once coolant flow is AND Flow time is between ANDeither Engine runtime is OR Insufficent coolant flow is present for A block heater is detected if a drop is **IAT Drop Criteria:** The sensor will be used as IAT for this method	CeAEHR_e_BlkHtrBlock ClntSnsr CeAEHR_e_BlkHtrCylHd ClntSnsr CeAEHR_e_BlkHtrRadO utCIntSnsr CeAEHR_e_BlkHtrIntake AirSnsr 8.0 °C 5.0 °C >9.0 °C CeAEHR_e_BlkHtrBlock ClntSnsr >2.00 L/min 0.1 -18.0 seconds < 78.0 seconds >300.0 seconds >1.8 °C		
				11.14°C 10.32 °C >A °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					A block heater will be detected if:	CeAEHR_e_BlkHtrIntake AirSnsr		
				>A°C	IAT has a drop of during a drive defined by: Drive time			
				>B°C	Vehicle speed	>5.0°C		
					Addtional drive time is provided when vehicle speed drops below above threshold as follows	>400.0 seconds >24.0kph		
				>B°C				
					This detection method will abort if the engine is off OR Engine runtime	0.5 times the seconds with vehicle speed below the threshold above > 180.0 seconds		
					Temperature Derivative Criteria: Derivative will be monitored using	> 1,800 seconds		
					Derivative will be monitored once coolant flow is AND Flow time is between AND either Engine runtime is OR Insufficent coolant flow is present for	CeAEHR_e_BlkHtrBlock ClntSnsr >-1.00 L/min 5.0 -15.0 seconds < 75.0 seconds		
					Derivative count will increment if derivative is	>300.0 seconds		
					If counts are a block heater is detected ==========	<-0.10°C/sec		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						> 4 counts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
EVAP Purge Pump Temperature Too High	P14A4	Purge pump indicates it is too hot to operate and is in a protection mode (shuts down and/ or will not turn on). Diagnostic rationalizes the purge pump too hot status against environmental and vehicle operating conditions.	Purge pump over temperature status AND Intake Air Temperature AND OBD Max Coolant Achieved (read description for details)	= True <45.0 °C = FALSE	Diagnostic is Enabled Propulsion system on LIN data available for LIN IAT data available Engine running time Powertrain relay voltage No Active DTC's No Pending DTC's	>2 counts >20 seconds >11.0 volts IAT_SensorFA ECT_Sensor_FA Purge Pump LIN Communication Fault Active Purge Pump LIN Communication Fault Pending	80 failures out of 100 samples 100 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Driver Control Module Configuratio n Command Signal 1 Message Counter Incorrect	P14CD	The FTZM monitors its specific command data serial message frames [message FTZM CommandI $0CE] received from the ECM over its private CAN channel and evaluates whether these data are updating regularly. The FTZM diagnostic runs every 10msec. Each FTZM diagnostic evaluation is sent back to the ECM over the private bus. When the ECM diagnostic detects that the transmitted message counter and the received message counter do not match, it will increment a fail counter. The diagnostic status is monitored using X/Y counting and the Diagnostic Trouble Code is set when the failure count has matured to its threshold value. The X/Y counting is a rolling array type where X of the most recent Y samples represent a failing status, and it is updated continuously with each execution loop and resets only on an end-of-trip event.	FTZM bus CAN Message CommandI $0CE Alive Rolling Counter transmitted from ECM OR FTZM bus CAN Message CommandI $0CE Protection Value checksum transmitted from ECM	<> ARC sequence at FTZM OR <> Protection Value checksum at FTZM	a) Diagnostic is .. b) Diagnostic System Disabled c) System Voltage [Batt In Range] d) FTZM bus [Sensor Bus] Wakeup signal e) Diagnostic delay time f) Message Received status g) Data Received status h) No message fault conditions present	a) .. Enabled b) == False c) > 8.0 volts d) == TRUE e) > 3,000 msec f) == TRUE g) == TRUE h) == TRUE	15 fail counts out of 16 sample counts continuously updated rolling array 12.5 msec loop execution	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Throttle Position Steady State Actuation Fault	P1516	Detect an inablity to maintain a steady state throttle position.	The absolute difference between desired and indicated throttle position is >	2.00%	Run/Crank voltage TPS minimum learn is not active AND Throttle is being Controlled Throttle is considered in a steady state condition when the desired throttle position over a 12.5 ms period is For a settling time period Ignition voltage failure is false	> 6.41 Volts < 0.25 percent > 4.00 seconds P1682	0.49 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Switch State Undertermined Bank 1 and 2	P155A	Detects when cruise switch state cannot be determined, such as low voltage condition When the BCM tells the ECM that the cruise switch "Indeterminate" (momentary on/off switch architectures) is detected for too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	cruise switch state is received as "undetermined" for greater than a calibratable time over a sample period.	fail in the indeterminate state for greater than 3.00 seconds over the sample period of 15.00 seconds	Diagnostic is enabled.		indicate failure for 3.00 seconds / 15.00 seconds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Set/ Coast Signal 2 Circuit Switch Bank 1 or 2	P155B	Detects a failure of the cruise set 2 switch in a continously applied state. When the BCM tells the ECM that the cruise control analog input voltage is stuck in Decrease High state for too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	Cruise Control Set 2 switch remains applied for greater than a calibratable period of time.	fail in the applied state for greater than 89.00 seconds over the sample period of 99.00 seconds	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	fail for greater than 89.00 seconds/ 99.00 seconds	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Resume/ Acceleration Signal 2 Circuit Switch Bank 1 or 2	P155C	Detects a failure of the cruise resume 2 switch in a continously applied state "When the BCM tells the ECM that the cruise control analog input voltage is stuck in Increase High state for too long, ECM sets the code and cruise control will be disabled and disengaged for the remainder of the key cycle regardless of current pass/fail condition once it fails."	Cruise Control Resume 2 switch remains applied for greater than a calibratable period of time over a sample period.	fail in the applied state for greater than 89.00 seconds over the sample period of 99.00 seconds	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	fail for greater than 89.00 seconds/ 99.00 seconds	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cruise Control Lane Center Switch Circuit Switch Bank 1 or 2	P1589	Detects a failure of the cruise lane centering control switch in a continously applied state "When the BCM tells the ECM that the cruise control analog input voltage is stuck in the LCC (Lane Centering Control) state for too long, ECM sets the code and adaptive cruise control will be disabled and disengaged for the remainder of the key cycle."	Lane Center Control switch remains applied for greater than a calibratable period of time over a sample period.	fail in the applied state for greater than 20.00 seconds over the sample period of 25.00 seconds	Diagnostic is enabled. CAN cruise switch diagnostic enable in ECM	1.00	fail for greater than 20.00 seconds/ 25.00 seconds	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module SIDI High Pressure Pump current monitor	P163A	This DTC Diagnoses the current from the control area and compares it with calibrated thresholds to set current high and low flags	SIDI fuel pump High Current Test Current SIDI fuel pump Low Current Test Current	 >= 11.00 Amps <= 0.10 Amps	Battery Voltage Low Side Fuel Pressure Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP orTFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false andEngine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA	>= 11 Volts > 0.300 MPa Enabled when a code clear is not active or not exiting device control Engine is not cranking	Current High/ Low 10 seconds failures out of 12.50 seconds sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Ignition voltage out of correlation error(P1682) not active and Barometric Pressure Inlet Air Temp Fuel Temp	 >= 70.0 KPA >= -20.0 degC -20 <= Temp degC <= 126		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ignition Voltage Correlation	P1682	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage and the Powertrain Relay Ignition Voltage. The diagnostic monitors the difference in voltage between Run/Crank Voltage and the Powertrain Relay Ignition Voltage and fails the diagnostic when the voltage difference is too high. This diagnostic only runs when the powertrain is commanded on and the Run/Crank Voltage is greater than a threshold based on IAT or the powertrain ignition voltage is high enough the Run/Crank voltage is high enough.	|Run/Crank - PT Relay Ignition| >	3.00 Volts	Powertrain Relay commanded on AND (Run/Crank voltage >| OR PT Relay Ignition voltage >|) AND Run/Crank voltage >|	 Table, f(IAT). See supporting tables: **P1682_PT Relay Pull-in Run/Crank Voltage f(IAT)** 5.50 Volts 5.50 Volts	240/480 counts; or 0.175 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ignition Voltage Correlation #2	P16A7	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage and the Powertrain Relay Ignition Voltage #2. The diagnostic monitors the difference in voltage between Run/Crank Voltage and the Powertrain Relay Ignition Voltage and fails the diagnostic when the voltage difference is too high. This diagnostic only runs when the powertrain is commanded on and the Run/Crank Voltage is greater than a threshold based on IAT or the powertrain ignition voltage is high enough the Run/Crank voltage is high enough. Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the Powertrain Relay Ignition Voltage #2.	|Run/Crank - PT Relay Ignition| >	3.00 Volts	Powertrain Relay commanded on AND (Run/Crank voltage >| OR PT Relay Ignition voltage >) AND Run/Crank voltage >	 Table, f(IAT). See supporting tables: **P16A7_PT Relay Pull-in Run/Crank Voltage f(IAT)** 5.50 Volts 5.50 Volts	240/480 counts; or 0.175 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Controls Ignition Relay Feedback Circuit 2 Low Voltage - (GEN III Controllers ONLY)	P16AF	Detects low voltage in the engine controls ignition relay feedback circuit 2. This diagnostic reports the DTC when low voltage is present. Monitoring occurs when run crank voltage is above a calibrated value.	Engine controls ignition relay feedback circuit 2 low voltage	Relay voltage <= 5.00	Powertrain relay low diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 1.00 >=11.00 >9.00 = ON	5 failures out of 6 samples 1000 ms/ sample	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Controls Ignition Relay Feedback Circuit 2 High Voltage -(GEN III Controllers ONLY)	P16B3	Detects high voltage in the engine controls ignition relay feedback circuit 2. This diagnostic reports the DTC when high voltage is present. Monitoring occurs when the relay state is inactive.	Engine controls ignition relay feedback circuit 2 high voltage	Relay voltage >=4.00	Powertrain relay high diag enable Powertrain relay state	= 1.00 = INACTIVE	50 failures out of 63 samples 100 ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Sensor Bus Relay Control Circuit	P16D7	Detects an open circuit in the sensor bus relay circuit. This diagnostic reports the DTC when an open circuit is present. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver off state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	Open Circuit: > 200 K Q ohms impedance between output and controller ground	Sensor Bus relay circuit open diagnostic = TRUE Run/Crank Voltage	1.00 Voltage > 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controlle rs P16D8 may also set (Sensor Bus Relay Control Circuit Low).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Sensor Bus Relay Control Circuit Low	P16D8	Detects a short to ground in the sensor bus relay circuit. This diagnostic reports the DTC when a short to ground is present. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	Short to ground: < 0.5 Q impedance between output and controller ground	Sensor Bus relay circuit short to ground diagnostic = TRUE Run/Crank Voltage	1.00 Voltage >11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controller s P16D7 may also set (Sensor Bus Relay Control Circuit Open).

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Sensor Bus Relay Control Circuit High	P16D9	Detects a short to power in the sensor bus relay circuit. This diagnostic reports the DTC when a short to power is present. A decision is made by comparing a voltage measurement to a controller specific voltage threshold.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	Short to power: < 0.5 Q impedance between output and controller power	Sensor Bus relay circuit short to power diagnostic = TRUE Run/Crank Voltage	1.00 Voltage >11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module Transmission Range Control Performance	P16F4	Determines if the Electronic Transmission Range Select control module software incorrectly processes a range request which would result in an unsafe condition	Driver Requested Arbitrated Range Commanded OR: Transmission range control routine Transmission range control routine Transmission range control routine	is issued unexpectedly OR # expected range Does not issue Park or Neutral command quickly enough in response to driver request Issues a request to Drive, Low or Manual without a matching input by the customer within a calibrated time T1. Issues a request to Reverse without a matching input by the customer within a calibrated time limit T2.	TRCR Global Diagnostic Enable CodeClearFunction AND ManufacturingModeActive AND: External: Run/Crank OR Accessory/Wakeup Internal: From the time when RunCrankActive until ActualRange AND Accessory/Wakeup	= True =False =False =True = True =True =Park =False	200, 200, 200,2,050, 200 or 200 msec, depending on conditions. T1 = 200 msec T2 = 200 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Unexpected Range Change Detected	P1787	Detects an unexpected change in transmission range.	Actual Arbitrated Transmission Range The internal system only diagnoses range changes in and out of Park.	# Previous Value and # Commanded Range	Actual Tranmission Range Range Change Achievement Diag	= Valid Range = Not running	1,500 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Current Transmission Range Unknown	P1789	Detects the failure of the ETRS system to identify the current transmission range with sufficient confidence.	Actual Transmission Range	= Undefined	Range Indication Source AND CodeClearFunction AND ManufacturingModeActive AND: External: Run/Crank OR Accessory/Wakeup Internal: From the time when RunCrankActive until ActualRange AND Accessory/Wakeup	= Valid =False =False =True = True =True =Park =False	80 failures out of 100 samples 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Switch A/B Circuit Stuck On	P17F3	Checks if both Park switches are stuck closed	Both Park Switches are PRESSED	> 1.00 seconds	Not Fault Active Controller is "on"	P07B3, P07B4, P07B4, P07B9, P07BA, P07BB >~ 100 ms	4,800.00 failures out of 6,000.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Position Switch A/B Circuit Stuck Off	P189D	Compares Park Switch A and Park Switch B "PRESSED" and "RELEASED" states	[1] The number of Park button Press AND Switch-1-Closed count AND Switch-2-Closed count	>=8.00 <= 0.08* 8.00 >=0.80* 8.00	Not Fault Active Controller is on Park button switch signals: Vehicle Speed Comprehensive correlation diagnostics:	P07B3, P07B4, P07B5, P07B9, P07BA, P07BB >~100 ms =valid <= Park Request Spd, calibrated with a hysteresis loop: 8.00 and 7.50 . =True*	This is based on the number of button and switch activation, not time. *note: these samples can accumulate over key-cycles	Type B, 2 Trips
			1] The number of Park button Press AND Switch-1-Closed count AND Switch-2-Closed count	>=8.00 >= 0.80* 8.00 <=0.08* 8.00	Not Fault Active Controller is on Park button switch signals: Vehicle Speed Comprehensive correlation diagnostics:	P07B3, P07B4, P07B5, P07B9, P07BA, P07BB >~100 ms =valid <= Park Request Spd, calibrated with a hysteresis loop: 8.00 and 7.50 . =True*	This is based on the number of button and switch activation, not time. *note: these samples can accumulate over key-cycles	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Selector Switch "L" Stuck On	P18E1	Detects TRC Switch "L" is stuck on. Switch "L" = Manual/ Low Input	Valid switch status "pressed" for a longer than expected time.		Not Fault Active	P186B, P186C, P186D	4,800 failures out of 6,000 samples 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Replicated Cam Signal	P193C	The PCM monitors the Replicated Camshaft Sensor Signal fault status provided by the Smart Device over CAN network. If signal indicates a fault then both sample and fail counters will be incremented otherwise only the sample counter will be incremented. If fail counter is greater than or equal to the failure threshold before sample counter reaches sample threshold then report failure.	The PCM monitors the Replicated Camshaft Sensor Signal fault status provided by the Smart Device over CAN network. If signal indicates a fault then both sample and fail counters will be incremented otherwise only the sample counter will be incremented. If fail counter is greater than or equal to the failure threshold before sample counter reaches sample threshold then report failure.	System measures 3 states for Cam Phaser Status signal, ERROR (when no cam pulses detected by 295 degCA), INDETERMINATE (when cam pulses are not detected in 10ms sending time & crank pulses are detected up to 295 degCA), NO ERROR (when cam pulses are detected in one of the two 5ms raster rates in 10ms sending time)	Ephaser Application Replicated Cam Output Fault Cam Sensor Fault Cam/Crank Correlation Fault Engine RPM in range Loss of Can Fault Active Diagnostic Enable	= Enabled = False = False = False >=500.00 = False = Enabled	100.00 failures out of 120.00 samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Replicated Crank Signal	P193D	The PCM monitors both Time-Based and Synchronization-Based Replicated Crankshaft Sensor Signal fault status provided by the Smart Device over CAN network. If signal indicates a fault in either signal then both sample and fail counters for that signal will be incremented otherwise only the sample counter will be incremented. If fail counter is greater than or equal to the failure threshold before sample counter reaches sample threshold for both signals then report failure.	The PCM monitors both Time-Based and Synchronization-Based Replicated Crankshaft Sensor Signal fault status provided by the Smart Device over CAN network. If signal indicates a fault in either signal then both sample and fail counters for that signal will be incremented otherwise only the sample counter will be incremented. If fail counter is greater than or equal to the failure threshold before sample counter reaches sample threshold for both signals then report failure.The PCM monitors the Replicated Crankshaft Sensor Signal fault status provided by the Smart Device over CAN network. If signal indicates a fault then both sample and fail counters will be incremented otherwise only the sample counter will be incremented. If fail counter is greater than or equal to the failure threshold before sample counter reaches sample threshold then report failure.	System measures 2 sets of 3 states for Crank Phaser Status signal, 3 Time-Based and 3 Synchronization Based, TIME-BASED ERROR (when no crank pulses detected on either of the two 5ms Raster rates in 10ms sending time), INDETERMINATE (when no crank pulses and no angle sensor movement detected (key on, no engine movement)) NO ERROR (when crank pulses are detected in both of the two 5ms raster rates in 10ms sending time) SYNCHRONIZATION BASED ERROR (when less than or more than 58 teeth are counted before sync gap is found) INDETERMINATE (when counting to 58 as it has not passed this sync check) NO ERROR (when exactly 58 teeth are counted between sync gaps)	Ephaser Application Replicated Crank Output Fault Crank Sensor Fault Cam/Crank Correlation Fault Engine RPM in range Loss of Can Fault Active Diagnostic Enable	= Enabled = False = False = False >=500.00 = False = Enabled	100.00 failures out of 120.00 samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Home Learn Routine	P1945	The PCM monitors the Home Learn status from the Smart Device and sets a fault if a Home Learn Request was attempted but does Home Learn Complete timer is more than or equal to the Home Learn timeout limit.	The PCM monitors the Home Learn status from the Smart Device and sets a fault if the Home Learn timeout timer is more than the Home Learn timeout limit.	Home Learn Complete not received within 15.10ms of attempted Home Learn.	Ephaser Application	= Enabled	15.10ms	Type A, 1 Trips
					Replicated Cam Output Fault	= False		
					Cam Sensor Fault	= False		
					"A" Camshaft Position Actuator "A" Camshaft Position Signal Input Circuit Fault	= False		
					Cam/Crank Correlation Fault	= False		
					Replicated Crank Output Fault	= False		
					"A" Camshaft Position Actuator Crankshaft Position Signal Input Circuit Fault	= False		
					Lost Communication with Intake/Single Camshaft Position Actuator Fault	= False		
					Loss of Can Fault Active	= False		
					Diagnostic Enable	= Enabled		
					VePHSD_b_HomeLearnTOErrorRpt	= False		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 2 Performance (For use on vehicles with two fuel senders and mechanical transfer pump)	P2066	This DTC will detect a secondary fuel tank level sensor stuck in-range.	1) If Deadband diagnostic subtest Enabled AND 2a) If fuel volume in primary tank is and 2b) if fuel volume in secondary tank is and 2c) and if 2a and 2b indications do not change while fuel volume consumed by engine is	 2a) >43.9 liters 2b) <4.8 liters 2c) >14.2 liters	1a) Diagnostic is Enabled 1b) Engine Operational Status	 1b) == Running	250 ms / sample	Type B, 2 Trips
			1) If Secondary sensor rationality diagnostic subtest enabled AND 2a) Volume in primary tank is 2b) and volume in secondary tank is 2c) and remains in this condition for	 2a) <44 liters 2b) > 5 liters 2c) >1,800 seconds	1a) Diagnostic is Disabled 1b) Engine Operational StatusEngine Running	 1b) == Running	250 ms / sample	
			a) If indicated fuel volume change is b) while fuel consumed by the engine is	a) < 3.00 liters b) > 20 liters	1a) Diagnostic is Enabled 1b) Engine Operational StatusEngine Running 2) Secondary tank volume [Not Empty] is	 1b) == Running 2) >4.8 liters	250 ms / sample	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 2 Circuit Low Voltage (For use on vehicles with two fuel senders connected to an FTZM)	P2067	This DTC will detect a fuel sender out-of-range low in the secondary fuel tank.	Fuel level Sender % of 5V range	<10%	a) Diagnostic is Enabled b) Fuel Level Sensor Initialized status c) Fuel Level Sensor Data Available Status d) Communication faults status	 b) == True c) == True d) <> True	40 failures out of 50 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Level Sensor 2 Circuit High Voltage (For use on vehicles with two fuel senders connected to an FTZM)	P2068	This DTC will detect a fuel level sensor out-of-range high in the secondary fuel tank.	Fuel level Sender % of 5V range	> 60 %	a) Diagnostic is Enabled b) Fuel Level Sensor Initialized status c) Fuel Level Sensor Data Available Status d) Communication faults status	 b) == True c) == True d) <> True	40 failures out of 50 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Camshaft Actuator Solenoid Circuit Low-Bank 1	P2090	Controller specific output driver circuit diagnoses the CAM phaser oil control valve solenoid high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 0.5 Q impedance between signal and controller ground	Diagnostic is Enabled System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Exhaust Camshaft Actuator Solenoid Circuit High - Bank 1	P2091	Controller specific output driver circuit diagnoses the CAM phaser oil control valve solenoid high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 0.5 0 impedance between signal and controller power	Diagnostic is Enabled System supply voltage Output driver Ignition switch	 > 11.00 Volts On Crank or Run	20 failures out of 25 samples 250 ms /sample, continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Post Catalyst Fuel Trim System Too Lean Bank 1	P2096	Determines if the post catalyst 02 sensor based fuel control system is indicating a lean exhaust gas condition. If the lean condition is such that the control system utilizes all or most of its available high limit authority (high limit = 100% authority), then P2096 will set. The monitor can be calibrated to fail based on the Average Integral Offset % Authority, the Average Total Offset % Authority or both combined. The Average Total Offset metric consists of the average of the Integral Offset+ Proportional Offset. Note: When the post catalyst 02 voltage is too lean, the post catalyst 02 integral and proportional offset control is increased (positive % authority). This applies a rich bias to fuel control in an attempt to counteract the lean condition. A perfectly balanced control system (no rich or lean bias required) is represented by integral	The Average Integral Offset % Authority AND The Average Total Offset % Authority (Note: any value greater than or equal to +100% effectively nullifies the Average Total Offset % Authority criteria) High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 29%for>= 1.0 seconds AND the % Authority metric is approaching the failure threshold. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 25% for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 65.0 % >= 46.0 % If the P2096 is actively failing then the Average Integral Offset must be < 65.0 % and the Average Total Offset must be < 46.0 % for the diagnostic to report a pass.	The post cat fuel trim diagnostic is enabled The diagnostic is enabled during: Deceleration Idle Cruise Light Acceleration Heavy Acceleration Ambient Air Pressure Engine AirFlow Intake Manifold Pressure Induction Air Temperature Start-up Coolant Temp. PTO Intrusive diag. fuel control Ethanol Estimation in Progress 02 Heater Learned Resistance Long Term Secondary Fuel Trim Enabled for (see **"Long Term Secondary Fuel Trim Enable Criteria"** in Supporting Tables) High Vapor Conditions Green Cat System	No No Yes No No >= 70 kPa >= 5.0 g/s <= 10,000.0 >=16 kPa <= 256 >—-20 deg. C <= 150 >= -20 deg. C (or OBD Coolant Enable Criteria = TRUE) Not Active Not Active Not Active = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's") >= 0.1 seconds Not Present = Not Valid,	Frequency: Continuous Monitoring in 100ms loop. The Integral and Total Offset % Authority metrics are sampled every 100ms and an average is calculated every 30.0 seconds (300 samples) before comparing to their respective failure thresholds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		and proportional offset values of "0" (i.e. 0% authority) and a post catalyst 02 sensor that is within its optimal operating range (neither rich nor lean).			Condition ---------- Delay during GPF Regeneration If the diagnostic delays during a GPF Regen, it will continue to delay following completion of the Regen until the following number of samples have been accumulated. (1 sample = 100ms): Deceleration Idle Cruise Light Acceleration Heavy Acceleration ---------- No Fault Active for:	Green Cat System condition is considered valid until the accumulated air flow is greater than 360,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C and airflow is above 22 grams/sec. ---------- No Delay 0.00 0.00 0.00 0.00 0.00 ---------- AmbientAirDefault AIR System FA Ethanol Composition Sensor FA ECT_Sensor_FA EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorFA_		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						CamSensorAnyLocationFA EvapEmissionSyste m_FA EvapFlowDuringNonPurge_FA FuelTankPressureSnsrCkt_FA EvapPurgeSolenoidCircuit_FA EvapSmallLeak_FA EvapVentSolenoidCircuit_FA FuelInjectorCircuit_FA MAF_SensorFA MAF_SensorTFTKO MAP_SensorFA MAP_EngineVacuumStatus EngineMisfireDetected_FA A/F Imbalance BankI O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA		
					For the cells identified as enabled (i.e. those containing a "Yes" at the beginning of the Enable Conditions column), the minimum accumulated samples required before the fuel control metric is considered usable for that cell (1 sample = 100ms):			
					Deceleration Idle Cruise Light Acceleration Heavy Acceleration	100 100 100 100 100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(Note: A value in any of the above operating "cells" that is an order of magnitude (or more) higher than other cells is an indication that the diagnostic is not capable of diagnosing in that cell).			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Post Catalyst Fuel Trim System Too Rich Bank 1	P2097	Determines if the post catalyst 02 sensor based fuel control system is indicating a rich exhaust gas condition. If the rich condition is such that the control system utilizes all or most of its available low limit authority (low limit = -100% authority), then P2097 will set. The monitor can be calibrated to fail based on the Average Integral Offset % Authority, the Average Total Offset % Authority or both combined. The Average Total Offset metric consists of the average of the Integral Offset+ Proportional Offset. Note: When the post catalyst 02 voltage is too rich, the post catalyst 02 integral and proportional offset control is decreased (negative % authority). This applies a lean bias to fuel control in an attempt to counteract the rich condition. A perfectly balanced control system (no rich or lean bias required) is represented by integral	The Average Integral Offset % Authority AND The Average Total Offset % Authority (Note: any value less than or equal to -100% effectively nullifies the Average Total Offset % Authority criteria) High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 29%for>= 1.0 seconds. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 25% for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	<= -77.0 % <= -48.0 % If the P2097 is actively failing then the Average Integral Offset must be > -77.0 % and the Average Total Offset must be > -48.0% for the diagnostic to report a pass.	Same as P2096	Same as P2096	Frequency: Continuous Monitoring in 100ms loop. The Integral and Total Offset % Authority metrics are sampled every 100ms and an average is calculated every 30.0 seconds (300 samples) before comparing to their respective failure thresholds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		and proportional offset values of "0" (i.e. 0% authority) and a post catalyst 02 sensor that is within its optimal operating range (neither rich nor lean).						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Throttle Actuator Position Performance	P2101	1) Detect a throttle positioning error. This is determined if the difference between measured throttle position and modeled throttle position is greater than a threshold or less than a threshold. This diagnostic only runs when the engine is running and the voltage is high enough and there is not a voltage failure and the throttle position minimum learn is not active and the throttle is being controlled 2) Throttle control is driving the throttle in the incorrect direction. This is determined if the throttle position is greater than a threshold percent and the powertrain relay voltage is high enough and the throttle position minimum learn is active.	Difference between measured throttle position and modeled position, (modeled = MAX (Commanded vs. Commanded Filtered)) > OR Difference between modeled position (modeled = MIN (Commanded vs. Commanded Filtered)) and measured throttle position >	10.00 % 10.00 %	TPS minimum learn is not active AND Powertrain Relay Contactl Fault is FALSE (no P1682 fault) AND Throttle Control is not in Service or DVT control AND Throttle is being Controlled AND ((Engine Running AND Battery Voltage) OR Battery Voltage) AND (PT Relay Command On OR ((Engine Running AND Powertrain Relay Voltage) OR Powertrain Relay Voltage)) AND ((Engine shutdown procedure is not complete) OR (Run/Crank signal is	> 5.50 Volts > 8.41 Volts > 5.50 Volts > 8.41 Volts	15 counts; 12.5 ms/count in the primary processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					active))			
			Throttle Position >	52.71 %	TPS minimum learn active AND Powertrain Relay ContactI Fault is FALSE (no P1682 fault) AND Throttle Control is not in Service or DVT control	= TRUE	11 counts; 12.5 ms/count in the primary processor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Throttle Return to Default Performance	P2119	Throttle unable to return to default throttle position after de-energizing ETC motor.	(Normalized TPS1 percent Vref > AND Normalized TPS2 percent Vref> On the main processor) OR (Normalized TPS1 percent Vref < AND Normalized TPS2 percent Vref< On the main processor) (100% corresponds to 5.0 Volt)	2.3810% Vref 2.3840 % Vref 2.0590 % Vref 2.0560 % Vref	Throttle de-energized due to one of the following conditions: Powerup Default Learn OR Default Throttle Authority OR PT Relay Voltage OR Main System Shutdown OR Battery Saver Active OR (Powertrain Relay On AND Run/Crank Active)	= TRUE = TRUE < 5.500 Volts = TRUE = TRUE = FALSE = FALSE	0.4969 s if ETC motor command is STOP (when Default Throttle Authority or Main System Shutdown is causing Throttle de-energize) 5.0000 s if ETC motor command is not STOP	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 1 Lo	P2122	Detects a continuous or intermittent short low or open in the APP sensor #1 by monitoring the APP1 sensor percent Vref and failing the diagnostic when the APP1 percent Vref is too low. This diagnostic only runs when battery voltage is high enough. Detects a continuous or intermittent short low or open in the APP sensor #1 on the Main processor.	APP1 percent Vref < (100% corresponds to 5.0 Volt)	9.25 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P06A3	19/39 counts; or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 1 Hi	P2123	Detects a continuous or intermittent short high in the APP sensor #1 by monitoring the APP1 sensor percent Vref and failing the diagnostic when the APP1 percent Vref is too high. This diagnostic only runs when battery voltage is high enough. Detect a continuous or intermittent short high in the APP sensor #1 on the Main processor.	APP1 percent Vref > (100% corresponds to 5.0 Volt)	95.00 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	>6.41 Volts P06A3	19/39 counts; or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 2 Lo	P2127	Detects a continuous or intermittent short low or open in the APP sensor *#2* by monitoring the APP2 sensor percent Vref and failing the diagnostic when the APP2 percent Vref is too low. This diagnostic only runs when battery voltage is high enough. Detects a continuous or intermittent short low or open in the APP sensor *#2* on the Main processor.	APP2 percent Vref < (100% corresponds to 5.0 Volt)	6.50 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P0697	19/39 counts; or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 2 Hi	P2128	Detects a continuous or intermittent short high in the APP sensor #2 by monitoring the APP2 sensor percent Vref and failing the diagnostic when the APP2 percent Vref is too high. This diagnostic only runs when battery voltage is high enough. Detect a continuous or intermittent short high in the APP sensor #2 on the Main processor.	APP2 percent Vref > (100% corresponds to 5.0 Volt)	52.00 % Vref	Run/Crank voltage No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts P0697	19/39 counts; or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Throttle Position (TP) Sensor 1-2 Correlation	P2135	Detect a continuous or intermittent correlation fault between TPS sensors #1 and #2 on Main processor. 1.) The diagnostic monitors the difference in position between TPS1 and the TPS2 and fails the diagnostic when the difference is too high. This diagnostic only runs when the battery voltage is high enough. 2.) The diagnostic monitors the difference in reference voltage between normalized min TPS1 and the normalized min TPS2 and fails the diagnostic when the difference is too high. This diagnostic only runs when the battery voltage is high enough. Detects a continuous or intermittent correlation fault between TPS sensors #1 and #2 on Main processor	Difference between TPS1 displaced and TPS2 displaced >	6.797%offset at min. throttle position with a linear threshold to 9.720% at max. throttle position	Run/Crank voltage No TPS sensor faults No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts (P0122, P0123, P0222, P0223) P06A3	79/159 counts; or 58 counts continuous; 3.125 ms/count in the main processor	Type A, 1 Trips
			Difference between (normalized min TPS1) and (normalized min TPS2) > (100% corresponds to 5.0 Volt)	5.000 % Vref	Run/Crank voltage No TPS sensor faults No 5V reference error or fault for # 4 5V reference circuit	> 6.41 Volts (P0122, P0123, P0222, P0223) P06A3	79/159 counts; or 58 counts continuous; 3.125 ms/count in the main processor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138	Detect a continuous or intermittent correlation fault between APP sensors #1 and #2 on Main processor. 1.) The diagnostic monitors the difference in position between APP1 and the APP2 and fails the diagnostic when the difference is too high. This diagnostic only runs when the battery voltage is high enough. 2.) The diagnostic also monitors the difference in reference voltage between normalized min APP1 and the normalized min APP2 and fails the diagnostic when the difference is too high. This diagnostic only runs when the battery voltage is high enough. Detects a continuous or intermittent correlation fault between APP sensors #1 and #2 on Main processor	Difference between APP1 displaced and APP2 displaced >	5.000% offset at min. pedal position with a linear threshold to 10.001 % at max. pedal position	Run/Crank voltage No APP sensor faults No 5V reference errors or faulst for # 3 & # 4 5V reference circuits	> 6.41 Volts (P2122, P2123.P2127, P2128) (P06A3, P0697)	19/39 counts intermittent; or 15 counts continuous, 12.5 ms/count in the main processor	Type A, 1 Trips
			Difference between (normalized min APP1) and (normalized min APP2) >	3.500 % Vref	Run/Crank voltage No APP sensor faults No 5V reference errors or faulst for # 3 & # 4 5V reference circuits	> 6.41 Volts (P2122, P2123.P2127, P2128) (P06A3, P0697)	19/39 counts intermittent; or 15 counts continuous, 12.5 ms/count in the main processor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 high side circuit shorted to ground	P2147	Controller specific output driver circuit diagnoses Injector 1 high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 1 high side circuit shorted to power	P2148	Controller specific output driver circuit diagnoses Injector 1 high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 1 volt between signal and controller power	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 high side circuit shorted to ground	P2150	Controller specific output driver circuit diagnoses Injector 2 high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 2 high side circuit shorted to power	P2151	Controller specific output driver circuit diagnoses Injector 2 high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	 <= 1 volt between signal and controller power	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector3 high side circuit shorted to ground	P2153	Controller specific output driver circuit diagnoses Injector 3 high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector3 high side circuit shorted to power	P2154	Controller specific output driver circuit diagnoses Injector 3 high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 1 volt between signal and controller power	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 high side circuit shorted to ground	P2156	Controller specific output driver circuit diagnoses Injector 4 high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector 4 high side circuit shorted to power	P2157	Controller specific output driver circuit diagnoses Injector 4 high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 1 volt between signal and controller power	Battery Voltage Engine Run Time	>=11 Volts >=0 Seconds P062B notFAorTFTK	10.00 failures out of 20.00 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Minimum Throttle Position Not Learned	P2176	Detect when the throttle position minimum learn on the main processor is not learned. This diagnostic detects this by monitoring if the throttle position is greater than a threshold and the number of learn attempts is greater than a threshold. This diagnostic only runs when the battery voltage is high enough and the throttle position minimum learn is active. Throttle position sensors were not in the minmum learn window after multiple attempts to learn the minimum.	During TPS min learn on the Main processor, TPS percent Vref > AND Number of learn attempts > (100% corresponds to 5.0 Volt)	11.48% Vref 10 counts	Run/Crank voltage TPS minimum learn is active No previous TPS min learn values stored in long term memory	> 6.41 Volts = TRUE	2.0 secs	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 2 Circuit Low	P2184	Circuit Continuity This DTC detects a short to ground in the a temperature sensor signal circuit or the temperature sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ 150°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr2 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NoUseAssg nmnt Temperature Sensor 5: CeEECR_e_NoUseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	< X Ohms X is equal to: Temp Sensor 1: 55 Ohms Temp Sensor 2: 48.0 Ohms Temp Sensor 3: 41.0 Ohms Temp Sensor 4: 55.0 Ohms Temp Sensor 5: 41.1 Ohms Temp Sensor 6: 48.0 Ohms Temp Sensor 7: 48.0 Ohms	Diagnostic is Enabled		5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 2 Circuit High	P2185	Circuit Continuity This DTC detects a short to high or open in a temperature signal circuit or the temperature sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ -60°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: RadCoolantTempSnsr Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	> X Ohms X is equal to: Temp Sensor 1: 175,000 Ohms Temp Sensor 2: 235,000 Ohms Temp Sensor 3: 355,000 Ohms Temp Sensor 4: 174,069 Ohms Temp Sensor 5: 354,669 Ohms Temp Sensor 6: 235,000 Ohms Temp Sensor 7: 235,000 Ohms	Diagnostic is Enabled Engine run time OR IAT min	 > 10.0 seconds > -20.0 °C	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 2 Circuit Intermittent/ Erratic	P2186	Circuit Erratic This DTC detects large step changes in a temperature signal circuit or the temperature sensor. Allowable high and low limits are calculated for the next sample based on the previous sample and sensor time constant. If the sensor responds faster than should be possible the DTC is set.	Temperature step change: 1) postive step change is greater than calculated high limit OR 2) negitive step change is lower than calculated low limit. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr2 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt		Diagnostic is Enabled No Active DTC's	EECR_TS2_Erratic_TFTK 0 EECR_TS2_CktHiLo_FA	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6 The calculated high and low limits for the next reading use the following calibrations: Temperature Sensor 1: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 2: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 3: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 4: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 5: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 6: 1) Sensor time constant 2) Sensor low limit 3) Sensor hiqh limit	 7.6 seconds -60.0 °C 200.0 °C 3.3 seconds -60.0 °C 200.0 °C 4.3 seconds -60.0 °C 200.0 °C 5.7 seconds -60.0 °C 200.0 °C 4.5 seconds -60.0 °C 200.0 °C 4.7 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Temperature Sensor 7: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit *****Generic Example***** If the last temp reading was 90 °C, the Time constant was calibrated at 10 seconds, the low limit was calibrated to -80 °C and the high limit was calibrated to 200 °C the calculated limits are 101 °C and 73 °C. The next reading (after the 90 °C reading) must be between 73 °C and 101 °C to be valid. **********	7.3 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Bank 1 Air-Fuel Ratio Imbalance	P219A	This monitor determines if there is an Air Fuel Imbalance in the fueling system for a cylinder on Bank 1. Detection is based on a the pre catalyst oxygen sensor voltage. The pre catalyst 02 voltage is used to generate a variance metric that represents the statistical variation of the 02 sensor voltage over a given engine cycle. This metric is proportional to the air-fuel ratio imbalance (variance is higher with an imbalance than without). The observed Variance is dependent on engine speed and load and is normalized by comparing it to a known "good system" result for that speed and load, and generating a Ratio metric. The Ratio metric is calculated by selecting the appropriate threshold calibration from a 17x17 table (see Supporting Table	Standard Mode Filtered Ratio The EWMA calculation uses the weighting coefficient from the following supporting table: **P219A EWMA Coefficient** For this program, the Optional Mode is NOT used Optional Mode Filtered Ratio The EWMA calculation uses the weighting coefficient from the following supporting table while in Optional Mode:	>0.700 If the diagnostic has reported a failure on the prior trip, the EWMA Filtered Ratio must fall below 0.450 in order to report a pass. This feature prevents the diagnostic from toggling between failing and passing. > 1.00 If the diagnostic has reported a failure on the prior trip, the Optional Mode Filtered Ratio must fall below 0.50 in order to report a pass. This feature prevents the diagnostic from toggling between failing and passing.	The A/F imbalance diagnostic is enabled System Voltage Fuel Level Engine Coolant Temperature Cumulative engine run time Diagnostic enabled at Idle (regardless of other operating conditions) Engine speed range Engine speed delta during a short term sample period Mass Airflow (MAF) range Cumulative delta MAF during a short term sample period Filtered MAF delta between samples Note: first order lag filter coefficient applied to MAF	No lower than 10.0 Volts for more than 0.2 seconds > 10.0% The diagnostic will disregard the fuel level criteria if the fuel sender is faulty. >-20 deg. C(orOBD Coolant Enable Criteria = TRUE) > 0.0 seconds No 1,100 to 4,000 RPM <960 RPM 5 to 1,000 g/s <5 g/s <0.75 g/s	Minimum of 1 test per trip, up to 10 tests per trip during RSR or FIR. The front 02 sensor voltage is sampled once per cylinder event. Therefore, the time required to complete a single test (when all enable conditions are met) decreases as engine speed increases. For example, 18.00 seconds of data is required at 1000 rpm while double this time is required at 500 rpm and half this time is required at 2000 rpm. This data is collected only when enable conditions are met, and as such significantly more operating time is required than is indicated above. Generally, a report will be	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		P219A Variance Threshold Bankl Table) and subtracting it from the measured Variance. The result is then divided by a normalizer calibration from another 17x17 table (see Supporting Table **P219A Normalizer Bankl Table).** This quotient is then multiplied by a quality factor calibration from a 17x17 table (see Supporting Table **P219A Quality Factor Bankl Table)** . This result is referred to as the Ratio. Note that the quality factor ranges between 0 and 1 and represents robustness to false diagnosis in the current operating region. Regions with low quality factors are not used. Finally, a EWMA filter is applied to the Ratio metric to generate the Filtered Ratio malfunction criteria metric. Generally, a normal system will result in a negative Filtered Ratio while a failing system will result in a positive Filtered	**P219A EWMA Coefficient Opt Table**		= 0.100 Air Per Cylinder (APC) APC delta during short term sample period Filtered APC delta between samples Note: first order lag filter coefficient applied to APC = 0.100 Spark Advance Throttle Area (percent of max) Intake Cam Phaser Angle Exhaust Cam Phaser Angle ---------- Electronic Waste Gate (eWG) present If eWG = yes then Waste Gate Position Intrusive eWG Feature If intrusive Waste Gate positin is enabled then the electronic Waste Gate will be commanded to the	160 to 650 mg/cylinder <240mg/cylinder <10.00 percent 0 to 100 degrees 2 to 200 percent 0 to 100 degrees 0 to 100 degrees ---------- Yes See Supporting tables for minimum and maximum wastegate positions **P219A Wastegate Position Min Bank 1** to **P219A Wastegate Position Max Bank 1** Disabled	made within 5 minutes of operation. For RSRorFIR, 20 tests must complete before the diagnostic can report.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Ratio. The range of the Filtered Ratio metric is application specific since both the emissions sensitivity and relationship between imbalance and the Variance metric are application specific. Some applications may need to command a unique cam phaser value before performing the above calculations since cam phasing has been shown to have an impact on overall signal quality. This application Does Not Use his feature. For programs using Active Fuel Management or Multiple Cam profiles, a secondary Imbalance Ratio can be calculated while in the secondary operating modes. This secondary ratio is an optional calculation and is labeled as the "Optional Mode Ratio". The Optional Mode Ratio is calculated the same as explained above with the following supporting			following range when the other enable conditions have been met. Intrusive Waste Gate Position Min Intrusive Waste Gate Position Max ---------- Delay during GPF Regeneration ---------- Active Fuel Management Firing Fraction if the Optional Mode is enabled (see Malfunction Criteria) Active Fuel Management Firing fraction for Optional Mode calculations Intrusive Firing Fraction during Fast Initial Response or Rapid Step Response If the intrusive Firing Fraction feature is enabled the Active Fuel Management firing fraction will be forced to a value above this threshold when in Fast Initial Response or in Rapid Step Response. ----------	25.0 100.0 ---------- No Delay ---------- 0.99 to 1.01 1.10 to 0.00 Disabled >=0.00 ----------		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		tables: **P219A Variance Threshold Bankl Opt Table** , **P219A Normalizer Bankl Opt Table** , and **P219A Quality Factor Bankl Opt Table**			For programs using multi-step cam profiles: High Lift Cam Profile will use: Low Lift Cam Profile will use: Quality Factor (QF) QF calibrations are located in a 17x17 lookup table versus engine speed and load (see Supporting Table **P219A Quality Factor Bankl Table**). QF values less than “1” indicate that we don’t have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of Variance data. Fuel Control Status Closed Loop and Long Term FT Enabled for: Device Control AIR pump CASE learn EGR EVAP	Standard Mode Filtered Ratio Standard Mode Filtered Ratio >=0.99 >= 1.2 seconds (Please see **"Closed Loop Enable Clarification"** and **"Long Term FT Enable Criteria"** in Supporting Tables) Not active Not on Not active Not intrusive Not intrusive		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Engine Over Speed Protection Idle speed control PTO Injector base pulse width 02 learned htr resistance Rapid Step Response (RSR): RSR will trigger if the Ratio result from the last test is AND it exceeds the last Filtered ratio by Once triggered, the filtered ratio is reset to: Fast Initial Response (FIR): FIR will trigger when an NVM reset or code clear occurs. Once triggered, the filtered ratio is reset to: No Fault Active for:	Not Active Normal Not Active Above min pulse limit = Valid (the 02 heater resistance has learned since NVM reset) >= 0.50 >=0.50 0.00 0.00 MAP_SensorFA MAF_SensorFA ECT_Sensor_FA TPS_ThrottleAuthorityDefaulted FuelInjectorCircuit_FA AIR System FA EvapExcessPurgePsbl_FA CamSensorAnyLocationFA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						FuelTrimSystemB1_FA O2S_Bank_1_Sensor_1_FA O2S_Bank_1_8ensor_2_FA WRAF_Bank_1_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure (BARO) Sensor Circuit Low (applications with LIN MAF)	P2228	Detects an eroneously low value being reported over the LIN serial connection from the BARO sensor. The diagnostic monitors the BARO sensor pressure output and fails the diagnostic when the pressure is too low. The BARO sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure. The BARO pressure value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	BARO Pressure	< 50.0 kPa	Diagnostic is Enabled LIN communications established with MAF		160 failures out of 200 samples 1 sample every 25 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure (BARO) Sensor Circuit High (applications with LIN MAF)	P2229	Detects an eroneously high value being reported over the LIN serial connection from the BARO sensor. The diagnostic monitors the BARO sensor pressure output and fails the diagnostic when the pressure is too high. The BARO sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure. The BARO pressure value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	BARO Pressure	> 110.0 kPa	Diagnostic is Enabled LIN communications established with MAF		160 failures out of 200 samples 1 sample every 25 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure (BARO) Sensor Circuit Intermittent (applications with LIN MAF)	P2230	Detects a noisy or erratic signal in the barometric pressure (BARO) circuit by monitoring the BARO sensor and failing the diagnostic when the BARO signal has a noisier output than is expected. When the value of BARO in kilopascals (kPa) is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of BARO readings. The result of this summation is called a “string length”. Since the BARO signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic BARO signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current BARO reading - BARO reading from 25 milliseconds previous)	> 100 kPa 40 consecutive BARO readings	Diagnostic is Enabled LIN communications established with MAF		4 failures out of 5 samples Each sample takes 1.0 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Pumping Current Circuit/Open Bank 1 Sensor 1 (For use with WRAF & Gen IV ECM	P2237	This DTC determines if theB1S1 WRAF 02 Sensor Pump Current signal circuit is Open. When enabled, the diagnostic monitors the failure counters it receives from the WRAF Application-Specific Integrated Circuit (ASIC). The diagnostic failure counter is incremented based on the fault bit message received from the ASIC. The DTC is set based on fail and sample counters.	B1S1 WRAF ASIC indicates a Open circuit on the Pump Current circuit signal. Open fail counts are accumulated to determine fault status. Note: This ASIC is referred to as ATIC142 (Continental).	The ASIC provides a fault indication when the pumping current circuit pin is open, or pump cell voltage is > 1.2V and reference cell voltage is < 1.2V Note: the fault must exist for previous 2.5 seconds, it is split in two stages, a passive stage of 1.875 seconds and an active stage of 0.625 seconds.	Diagnostic is Enabled DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	WRAF_Bank_1_FA P0135, P0030, P0031, P0032 = Valid = Ready = True = Complete > 20.0 seconds	20 failures out of 24 samples Continuous in 25 milli - second loop	Type B, 2 Trips
			B1S1 WRAF ASIC indicates a Open circuit on the Pump Current circuit signal. Open fail counts are accumulated to determine fault status. This application uses the following type of WRAF sensor: For NGK_ZFAS_U2 For Bosch_LSU_4p9	The ASIC provides a fault indication when the pumping current circuit fails the following criteria; Based on the type of WRAF sensor used; CeWRSG_e_Denso_PLUS_6p1 element resistance > 400 ohms pump cell reference resistance > Nernst	Diagnostic is Enabled DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	WRAF_Bank_1_FA P0135, P0030, P0031, P0032 = Valid = Ready = True = Complete > 20.0 seconds	20 failures out of 24 samples Continuous in 25 milli - second loop	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Note: This ASIC is referred to as CJ136 (next Gen version of CJ135 from Bosch).	reference resistance Note: the faults must exist for more than 10 msec to qualify for a fail flag.				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Pumping Current Performance Bank 1 (For use with WRAF - non E80	P223C	This DTC determines if the WRAF 02 sensor pumping current has an incorrect or out of range value. This DTC will detect open circuit faults to the Pump current, Ref Cell voltage, Ref Ground circuits. When enabled, the diagnostic monitors the pumping current in three different fault regions during DFCO. The individual diagnostic failure counters are incremented based on the diagnostic results in each region. The DTC is set based on any of the three individual fail and sample counters.	Fault condition present when the pump current is in any of the fault regions when this test is enabled during DFCO.	The three pump current fault regions are: A) Pump current >5.00 ma B) Pump current < 1.10 ma and >-1.10ma C) Pump current < -0.10 ma The three fault regions have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set.	Diagnostic is Enabled DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete). ********** Test starts when time in DFCO Test stops when time in DFCO	Use this fault bundle WRAF_Bank_1_FA Do not use this fault bundle WRAF_Bank_1_FA_Ver2 P0135, P0030, P0031, P0032 = Valid = Ready = True = Complete > 20.0 seconds **DFCO Active Minimum > Time (seconds)** in the Supporting Tables > **DFCO Active Maximum Time (seconds)** in the Supporting Tables	Region A: 128 failures out of 160 samples OR Region B: 128 failures out of 160 samples OR Region C: 128 failures out of 160 samples Sample rate is 25 msec. Test enabled during DFCO.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Reference Resistance Out Of Range Bank 1	P223E	This DTC determines if the WRAF 02 sensor reference cell has an incorrect or out of range resistance value. This test compares the element's resistance (from the WRAF sensor Application-Specific Integrated Circuit (ASIC)) to the expected values for the enabled condition. The element temperature is directly related to the element resistance based on the released sensor element specifications. The diagnostic failure counter is incremented if the element temperature is outside the expected range. This DTC is set based on the fail and sample counters.	Measured Reference cell temperature	< 650 Deg C OR >1,000.0 Deg C	Diagnostic is Enabled DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop System Voltage ********** Heater Warm-up delay Then Delay after WRAF circuit diagnostic delay **********	 O2S_HeaterBank1Snsr1_FA O2S_WRAF_Elec_Circut_Diag_TFTKO_B1S1 = Valid = Ready = True > 10.50 = Complete > 20.0 seconds	128 failures out of 160 samples Sample rate is 25 msec Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Reference Ground Circuit/Open Bank 1 Sensor 1 (For use with WRAF & Gen IV ECM	P2251	This DTC determines if the B1S1 WRAF 02 Reference Ground signal circuit is Open. When enabled, the diagnostic monitors the failure counters it receives from the WRAF Application-Specific Integrated Circuit (ASIC). The diagnostic failure counter is incremented based on the fault bit message received from the ASIC. The DTC is set based on fail and sample counters.	B1S1 WRAF ASIC indicates a Open circuit on the Reference Ground circuit signal. Open fail counts are accumulated to determine fault status. Note: This ASIC is referred to as ATIC142 (Continental).	The ASIC provides a fault indication when the reference ground circuit pin is open, or pump cell voltage is > 1.2V and reference cell voltage is > 1.2V Note: the fault must exist for previous 2.5 seconds, it is split in two stages, a passive stage of 1.875 seconds and an active stage of 0.625 seconds.	Diagnostic is Enabled DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	WRAF_Bank_1_FA P0135, P0030, P0031, P0032 = Valid = Ready = True = Complete > 20.0 seconds	20 failures out of 24 samples Continuous in 25 milli - second loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			B1S1 WRAFASIC indicates a Open circuit on the Reference Ground circuit signal. Open fail counts are accumulated to determine fault status. Note: This ASIC is referred to as CJ136 (next Gen version of CJ135 from Bosch).	The ASIC provides a fault indication when the reference ground circuit fails the following criteria; CJ136 H/W detection Note: the faults must exist for more than 10 msec to qualify for a fail flag.	Diagnostic is Enabled DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	WRAF_Bank_1_FA P0135, P0030, P0031, P0032 = Valid = Ready = True = Complete > 20.0 seconds	20 failures out of 24 samples Continuous in 25 milli - second loop	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Turbo/Super Charger Bypass Valve - Mechanical Turbocharge r with wastegate. Not supercharge r with mechanical compressor	P2261	This DTC indicates the compressor recirculation valve being stuck closed. This diagnostic is active at coast down let off conditions, where an airflow pulsation criteria is used as basis of this diagnostic.	When measuring time accumulated air mass flow derivate boost pressure is high pass filtered with filter frequency ********** A failure is detected when Acc. Filtered Air Mass Flow or Acc.Der.Filtered boost pressure	< 0.50 Second, = 10.00 Hz ********** >80.00 g/s > 99,999.00 kPa/s	Diagnostic enabled ********** Engine speed ********** Bypass valve commanded open duty cycle For at least ********** Pressure ratio over the compressor relative limit Condition keep true for x seconds extra ********** Negative transient -> TRUE Relative boost and Pressure derivate Hysteresis negative transient -> FALSE Relative boost or Pressure derivate ********** No Active DTCs:	True ********** >= 1,300 rpm ********** > 6.00 % >= 0.25 s ********** > refer to **P00C4 P2261: Compressor Surge Line** in Supporting Tables 0.80 s ********** TRUE >=25.00 kPa <=-150.00 kPa/s <0.00 kPa >10.00 kPa/s ********** BSTR_b_TurboBypassCktFA BSTR_b_BoostSnsrFA MAF_SensorFA	4 Failed tests out of 5 tests 25ms/ sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Signal Stuck Lean Bank 1 Sensor 2	P2270	The P2270 diagnostic is the first in a sequence of six intrusive secondary 02 monitors which include DTCs P2270, P013E, P013A, P2271, P013F, &P013B. ThisDTC determines if the secondary 02 sensor is stuck in a normal lean voltage range and thereby can no longer be used for secondary 02 sensor fuel control or for catalyst monitoring. This diagnostic increases the delivered fuel while monitoring the sensor signal and the accumulated mass air flow. This fault is set if the secondary 02 sensor does not achieve the required rich voltage before the accumulated mass air flow threshold is reached.	Post 02 sensor signal AND The Accumulated mass airflow monitored during the Stuck Lean Voltage Test	< 850mvolts > 70 grams	Diagnostic is Enabled No Active DTCs B1S2 DTCs Not active this key cycle System Voltage Learned heater resistance Green 02S Condition	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemBl TFTK0 FuelTrimSystemB2 TFTK0 EngineMisfireDetected_FA Ethanol Composition Sensor FA 02S_Bank_ 1_TFTK0 02S_Bank_ 2_TFTK0 P013A, P013B, P013E, P013F, P2270 or P2271 >10.5 Volts = Valid (the heater resistance has learned since NVM reset, see enable conditions for "H02S Heater Resistance DTCs") = Not Valid, Green 02S condition is considered valid until the accumulated air flow is greater than **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations:	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						B1S2, B2S2 (if applicable) in Supporting Tables tab. Airflow accumulation is only enabled when airflow is above 22.0 grams/sec.		
					Low Fuel Condition	= False		
					Only when FuelLevelDataFault	= False		
					Pedal position	< 3.0 %		
					Engine Airflow	2.0 < gps < 12.5		
					Closed loop integral	0.80 < C/L Int < 1.08		
					Closed Loop Active	= TRUE (Please see **"Closed Loop Enable Clarification"** in Supporting Tables).		
					Evap	not in control of purge		
					Ethanol Estimation in Progress	= Not Active (Please see **"Ethanol Estimation in Progress"** in Supporting Tables).		
					Post fuel cell	= Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info.		
					Crankshaft Torque	< 100.0Nm		
					EGR Intrusive diagnostic	= not active		
					All post sensor heater delays	= not active		
					O2S Heater (post sensor) on Time	> 60.0 sec		
					Transmission Temo_			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Predicted Catalyst temp Fuel State ========== All of the above met for at least 0.0 seconds, and then check the following Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled) Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled) ========== All of the above met for at least 1.0 seconds, and then the Force Cat Rich intrusive stage is requested. ========== During Stuck Lean test the following must stay TRUE or the test will abort: Commanded Fuel Crankshaft Torque	> -40.0 °C 475 < °C < 850 = DFCO possible ========== 950 < RPM < 3,000 900 < RPM < 3,100 32.9 < MPH < 80.8 31.1 < MPH < 82.0 0.96 < EQR < 1.08 <70.0Nm		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Signal Stuck Rich Bank 1 Sensor 2	P2271	The P2271 diagnostic is the fourth in a sequence of six intrusive secondary 02 monitors which include DTCs P2270, P013E, P013A, P2271, P013F, &P013B. ThisDTC determines if the secondary 02 sensor is stuck in a normal rich voltage range and thereby can no longer be used for secondary 02 sensor fuel control or for catalyst monitoring. This diagnostic commands fuel cut off while monitoring the sensor signal and the accumulated mass air flow. This fault is set if the secondary 02 sensor does not achieve the required lean voltage before the accumulated mass air flow threshold is reached.	Post 02 sensor signal AND The Accumulated mass airflow monitored during the Stuck Rich Voltage Test	> 100 mvolts >20.0 grams	Diagnostic is Enabled No Active DTCs B1S2 DTCs Not Active this key cycle System Voltage Learned heater resistance Green 02S Condition	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemBl TFTK 0 FuelTrimSystemB2 TFTK 0 EngineMisfireDetected_FA Ethanol Composition Sensor FA 02S_Bank_ 1_TFTKO 02S_Bank_ 2_TFTKO P013A, P013B, P013E, P013F or P2270 >10.5 Volts = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTCs") = Not Valid, Green O2S condition is considered valid until the accumulated air flow is greater than **Multiple DTC Use_Green Sensor Delay Criteria - Limit**	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						for the following locations: B1S2, B2S2 (if applicable) in Supporting Tables tab. Airflow accumulation is only enabled when airflow is above 22.0 grams/sec.		
					Low Fuel Condition Only when FuelLevelDataFault Fuel State DTC's Passed ========== After above conditions are met: DFCO mode is continued (w/o driver initiated pedal input).	= False = False = DFCO possible = P2270 = P013E = P013A ==========		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure Sensor C Circuit Low	P227C	Detects an eroneously low value being reported over the LIN serial connection from the BARO C sensor. The diagnostic monitors the BARO C sensor pressure output and fails the diagnostic when the pressure is too low. The BARO C sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure. The BARO C pressure value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	BARO C Pressure	< 50.0 kPa	Diagnostic is Enabled LIN communications established with MAF		160 failures out of 200 samples 1 sample every 25 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure Sensor C Circuit High	P227D	Detects an eroneously high value being reported over the LIN serial connection from the BARO C sensor. The diagnostic monitors the BARO C sensor pressure output and fails the diagnostic when the pressure is too high. The BARO C sensor is a pressure transducer which outputs a voltage proportional to the absolute pressure. The BARO C pressure value is transmitted to the ECM by the MAF sensor using the LIN serial communication protocol.	BARO C Pressure	> 110.0 kPa	Diagnostic is Enabled LIN communications established with MAF		160 failures out of 200 samples 1 sample every 25 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Barometric Pressure Sensor C Circuit Intermittent/ Erratic	P227E	Detects a noisy or erratic signal in the barometric pressure (BARO) C circuit by monitoring the BARO C sensor and failing the diagnostic when the BARO C signal has a noisier output than is expected. When the value of BARO C in kilopascals (kPa) is determined, a delta is calculated between the current reading and the previous reading. The absolute value of these deltas is summed over a number of BARO C readings. The result of this summation is called a “string length”. Since the BARO C signal is anticipated to be relatively smooth, a string length of a particular magnitude indicates a noisy or erratic BARO C signal. The diagnostic will fail if the string length is too high.	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current BARO C reading - BARO C reading from 25 milliseconds previous)	> 100 kPa 40 consecutive BARO C readings	Diagnostic is Enabled LIN communications established with MAF		4 failures out of 5 samples Each sample takes 1.0 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SIDI High Pressure Pump Performance	P228C	This DTC determines if the high pressure pump is not able to maintain target pressure. The fault is set if the measured fuel rail pressure is lower than desired fuel pressure by a value that can impact emission and drivability for a number of pump events.	Fuel Pressure Error (Desired Pressure - Measure Pressure)	>= **P228C P2C1F-High Pressure Pump Control (HPC) fail threshold of pressure too low** Mpa (see supporting tables)	High Pressure Pump Performance Diagnostic Enable Battery Voltage Low Side Fuel Pressure Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP orTFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) andCam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and	True >=11 Volts > 0.300 MPa Enabled when a code clear is not active or not exiting device control Engine is not cranking	Positive Pressure Error - 10.00 second failures out of 12.50 second samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active Barometric Pressure Inlet Air Temp Fuel Temp	>= 70.0 KPA >=-20.0 degC -20 <=Temp degC <= 126		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SIDI High Pressure Pump Performance	P228D	This DTC determines if the high pressure pump is delivering high pressure that desired pressure. The fault is set if the measured fuel rail pressure is higher than desired fuel pressure by a value that can impact emission and drivability for a number of pump events.	Fuel Pressure Error (Desired Pressure - Measure Pressure)	<= **P228D P2C20 - High Pressure Pump Control (HPC) fail threshold for pressure too high** Mpa (see supporting tables)	High Pressure Pump Performance Diagnostic Enable Battery Voltage Low Side Fuel Pressure Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP orTFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement	True >=11 Volts >0.300 MPa Enabled when a code clear is not active or not exiting device control Engine is not cranking	Negative Pressure Error - 10.00 second failures out of 12.50 second samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					detected is true andManufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active Barometric Pressure Inlet Air Temp Fuel Temp	 >= 70.0 KPA >= -20.0 DegC -20 <= Temp degC <= 126		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #1 CIRCUIT LOW	P2300	Diagnoses Cylinder #1 Ignition Control (E8T) output driver circuit for a Short to Ground fault. Controller specific output driver circuit diagnoses the low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 100 0 impedance between signal and controller ground	Engine running Ignition Voltage	> 11.0	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #1 CIRCUIT High	P2301	Diagnoses Cylinder #1 Ignition Control (E8T) output driver circuit for a Short to Power fault. Controller specific output driver circuit diagnoses the low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 100 0 impedance between signal and controller power	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #2 CIRCUIT Low	P2303	Diagnoses Cylinder #2 Ignition Control (E8T) output driver circuit for a Short to Ground fault. Controller specific output driver circuit diagnoses the low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 100 0 impedance between signal and controller ground	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #2 CIRCUIT High	P2304	Diagnoses Cylinder #2 Ignition Control (E8T) output driver circuit for a Short to Power fault	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 100 0 impedance between signal and controller power	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #3 CIRCUIT Low	P2306	Diagnoses Cylinder #3 Ignition Control (E8T) output driver circuit for a Short to Ground fault. Controller specific output driver circuit diagnoses the low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 100 0 impedance between signal and controller ground	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #3 CIRCUIT High	P2307	Diagnoses Cylinder #3 Ignition Control (E8T) output driver circuit for a Short to Power fault	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 100 0 impedance between signal and controller power	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #4 CIRCUIT Low	P2309	Diagnoses Cylinder #4 Ignition Control (E8T) output driver circuit for a Short to Ground fault. Controller specific output driver circuit diagnoses the low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	< 100 0 impedance between signal and controller ground	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
IGNITION CONTROL #4 CIRCUIT High	P2310	Diagnoses Cylinder #4 Ignition Control (E8T) output driver circuit for a Short to Power fault	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	< 100 0 impedance between signal and controller power	Engine running Ignition Voltage	> 11.0 Volts	50 Failures out of 63 Samples 100 msec rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve C Position Sensor Circuit Low (HEAT - RRV)	P23C4	Circuit Continuity This DTC detects a short to ground in the position sensor signal circuit. This is accomplished by monitoring the reported position. If the position goes out of the expected range the DTC is set.	Engine Coolant Bypass Valve C Positions Sensor SENT digital read value	<25.00	Diagnostic is Enabled SENT communitation is not in error Run Crank Ignition in Range Engine not cranking Engine Diag System	 RRV_PstnSnsr_LoC_FP = True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve C Position Sensor Circuit High (HEAT-RRV)	P23C5	Circuit Continuity This DTC detects a short to power in the position sensor signal circuit. This is accomplished by monitoring the reported position. If the position goes out of the expected range the DTC is set.	Engine Coolant Bypass Valve C Positions Sensor SENT digital read value	>4,076.00	Diagnostic is Enabled SENT communitation is not in error Run Crank Ignition in Range Engine not cranking Engine Diag System	 RRV_PstnSnsr_LoC_FP = True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve C Motor Current High (HEAT-RRV)	P23C6	Controller specific output driver circuit detects an overcurrent condition in the load circuit for the Engine Coolant Bypass Valve C when the H-Bridge is energized.	Current measurement outside of controller specific acceptable range when H-Bridge is energized	8.1A<X< 12.8A	Diagnostic is Enabled Run Crank Ignition in Range Engine not cranking Engine Diag System Driver over current test not failed this key-cycle	 = True = True = Enabled RRV_MtrCurrLim_TFTKO	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ignition Switch Run/ Start Position Circuit Low	P2534	Detects a low ignition switch run/start position curcuit. This diagnostic reports the DTC when this circut is low. Monitoring occurs when the ECM run/ crank is active.	Ignition switch Run/Start position circuit low	Run / Crank = FALSE	Ignition switch Run/Start position circuit low diag enable and Run / Crank active ECM	= 1.00 = TRUE	106 failures out of 132 samples 25 ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ignition Switch Run/ Start Position Circuit High	P2535	Detects a high ignition switch run/start position curcuit. This diagnostic reports the DTC when this circut is high. Monitoring occurs when the ECM run/ crank is NOT active.	Ignition switch Run/Start position circuit high	Run / Crank = TRUE	Ignition switch Run/Start position circuit low diag enable and Run / Crank active ECM	= 1.00 = FALSE	320 failures out of 400 samples 25 ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Camshaft Position Signal Output Circuit Low	P2615	Controller specific output driver circuit diagnoses the camshaft output low sided driver for a short to ground failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure.	Short to ground: <= 0.5 Ohms impedance between signal and controller ground Open Circuit: >= 200 K Ohms impedance between signal and controller ground	Powertrain Relay Voltage Engine is not cranking Camshaft Position Output is commanded high	Test is Enabled >= 11.0 Volts	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips Note: In certain controllers P2614 may also set (Camshaft Position Signal Output Circuit / Open)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Camshaft Position Signal Output Circuit High	P2616	Controller specific output driver circuit diagnoses the camshaft position output low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure.	Short to power: <= 0.5 Ohms impedance between signal and controller power	Powertrain Relay Voltage Engine is not cranking Camshaft Position Output is commanded low	Test is Enabled >= 11.0 Volts	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position Signal Output Circuit Low	P2618	Controller specific output driver circuit diagnoses the crankshaft position output low sided driver for an open circuit failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to ground failure.	Short to ground: <= 0.5 Ohms impedance between signal and controller ground Open Circuit: >= 200 K Ohms impedance between signal and controller ground	Powertrain Relay Voltage Engine is not cranking Crankshaft Position Output is commanded high	Test is Enabled >= 11.0 Volts	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips Note: In certain controllers P2617 may also set (Crankshaft Position Signal Output Circuit / Open)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Crankshaft Position Signal Output Circuit High	P2619	Controller specific output driver circuit diagnoses the crankshaft position output low sided driver for a short to power failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to power failure.	Short to power: <= 0.5 Ohms impedance between signal and controller power	Powertrain Relay Voltage Engine is not cranking Crankshaft Position Output is commanded low	Test is Enabled >= 11.0 Volts	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Off Timer Performance	P262B	This DTC determines if the hardware timer does not initialize or count properly. There are two tests to ensure proper functioning of the timer: Count Up Test (CUT) and Range Test (RaTe). Count Up Test (CUT): Verifies that the HWIO timer is counting up with the proper increment. Range Test (RaTe): When the run/crank is not active both the hardware and mirror timers are started. The timers are compared when module shutdown is initiated or run/crank becomes active.	Count Up Test: Time difference between the current read and the previous read of the timer Range Test: The variation of the HWIO timer and mirror timer is	> 1.50 seconds > 0.25%.			Count Up Test: 4 failures out of 20 samples 1 sec / sample Continuous while run/crank is not active and until controller shutdown is initiated. Range Test: Once per trip when controller shutdown is initiated or run/ crank becomes active.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve C Range/ Performance (HEAT-RRV)	P26BB	This DTC will detect when the valve cannot achieve the desired position within a calibrated threshold (degrees (angle)) after the Target position has stabilized for a calibratable amount of time or is moving slower than a calibratable rate. A failure of this diagnostic would indicate a slow or stuck part.	Absolute position deviation between target and actual	> 12.00 Degrees	Diagnostic is Enabled No DTCs Closed Loop position control Desired Position Gradient is stable Valve anti-sticking routine Engine Diag System Engine not cranking Run Crank Ignition in Range Engine Outlet Coolant AND Engine Outlet Coolant is not faulted OR OBD Coolant Enable Criteria	RRV_PstnSnsr_LoC_FA RRV_PstnSnsr_FA = Active = TRUE = Inactive = Enabled = True = True > -39.00 °C = TRUE = TRUE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve D Range/ Performance (HEAT-BRV)	P26C1	This DTC will detect when the valve cannot achieve the desired position within a calibrated threshold (degrees (angle)) after the Target position has stabilized for a calibratable amount of time or is moving slower than a calibratable rate. A failure of this diagnostic would indicate a slow or stuck part.	Absolute position deviation between target and actual	> 12.00 Degrees	Diagnostic is Enabled No DTCs Closed Loop position control Desired Position Gradient is stable Valve anti-sticking routine Engine Diag System Engine not cranking Run Crank Ignition in Range Engine Outlet Coolant AND Engine Outlet Coolant is not faulted OR OBD Coolant Enable Criteria	 BRV_PstnSnsr_HBridge_LoC_FA BRV_HBridge_PstnSnsr_FA = Active = TRUE = Inactive = Enabled = True = True > -39.00 °C = TRUE = TRUE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump Overspeed	P26CE	The purpose of the performance diagnostic is to detect and report a failure of the component. If the enable criteria are met, the difference between the commanded speed and the component actual speed is calculated. An overspeed condition is when the commanded speed is less than the component actual speed. The speed difference is filtered and when the difference is less than the overspeed calibrated fault threshold, the diagnostic reports a FAIL. If filtered speed difference does not exceed the overspeed calibrated fault threshold, the diagnostic reports a PASS. The diagnostic will continue to report as long as the enablement criteria are met. There are two different failure criteria as the pump feedback speed is dependent on the system voltage.	Any of the following fail criteria is met: **Criterial:** Filtered (Pump Command Speed - Pump Feedback Speed) 12V System Voltage **Criteria 2:** Filtered (Pump Command Speed - Pump Feedback Speed) 12V System Voltage	**P26CE Pump Overspeed Fail < Threshold** >= -9,999.00 V **P26CE Pump Overspeed Fail Threshold Low < Voltage** < -9,999.00 V	Diagnostic is Enabled Difference in Pump Command Speed from previous data sample to present data sample ========== Any of the following criteria is met: **Criteria** 1: Calibration to use fault pending is TRUE PECR_EMP_SpeedOORL_FP PECR_EMP_SpeedOORH_FP **Criteria 2:** Calibration to use fault pending is FALSE If either condition is achieved PECR_EMP_SpeedOORL_FA AND PECR_EMP_SpeedOORL_TFTKO OR PECR_EMP_SpeedOORH_FA AND PECR_EMP_SpeedOORH_TFTKO ==========	<250.00 RPM for >=3.00 s = 1.00(1 is TRUE) = Not Active = 1.00 (0 is FALSE) = Not Active = Not Active	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					PECR_MainCoolPmpSpd Act_Av PECR_MainCoolPmpSpd Act_Fol EECR_EngineInlet_FA Engine Inlet Coolant Temperature All of the following criteria are met for 12V System Voltage Pump Command Speed Pump Enable	= Not Active = Not Active >= -40.00 °C **P2B85 26CE Pump Speed Performance > Initialization Delay** > 11.00 V (with hysteresis disable <10.00 V) >= 300.00 RPM = True		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Starter Relay Drive Pinion Circuit Open (12VSS)	P26E4	Controller specific output driver circuit diagnoses the Tandem Starter Pinion Relay high sided driver for an open circuit failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates open circuit failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for an open circuit.	>= 200 KOhms impedance between signal and controller ground.	Starter relay pinion diag enable Engine speed Run Crank voltage	Enabled >=0.00RPM >= 11.00 volts	40 failures out of 50 samples 50 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Starter Relay Drive Pinion Circuit Low Voltage (12VSS)	P26E5	Controller specific output driver circuit diagnoses the Tandem Starter Pinion Relay high sided driver for a short to ground failure when the output is powered on by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground.	<= 0.5 Ohms impedance between signal and controller ground	Starter control diag enable Engine speed Run Crank voltage	Enabled >=0.00RPM >= 6.41 volts	8 failures out of 10 samples 50 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Starter Relay Drive Pinion Circuit High Voltage (12VSS)	P26E6	Controller specific output driver circuit diagnoses the Tandem Starter Pinion Relay high sided driver for a short to power failure when the output is powered off by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver off state indicates short to power failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to power.	<= 0.5 Ohms impedance between signal and controller power	Starter control diag enable Engine speed Run Crank voltage	Enabled >=0.00RPM >= 11.00 volts	40 failures out of 50 samples 50 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
02 Sensor Reference Resistance Out Of Range Bank 1 Sensor 2 (For use with EIC	P2963	This DTC determines if the EIC 02 sensing element has an out of range impedance value. This test compares the sensing element's temperature (computed using impedance value from the EIC sensor Application-Specific Integrated Circuit (ASIC)) to the expected values for the enabled condition. The element temperature is directly related to the element impedance based on the released sensor element specifications. The diagnostic failure counter is incremented if the element temperature is outside the expected range. This DTC is set based on the fail and sample counters.	Sensing element temperature outside of the expected range of	>1,000.00 or < 580.00 deg. C	Diagnostic is Enabled DTC's Not active this key cycle Engine Run or Auto stop System Voltage ********** Heater Warm-up delay Then... Delay after EIC circuit diagnostic delay **********	 EIC_Bank_1_Sensor_2_TFTKO = True > 10.50 = Complete >84.00 seconds	128.00 failures out of 160.00 samples Sample rate is 25 msec Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve D Position Sensor Circuit Low (HEAT - BRV)	P29FA	Circuit Continuity This DTC detects a short to ground in the position sensor signal circuit. This is accomplished by monitoring the reported position. If the position goes out of the expected range the DTC is set.	Engine Coolant Bypass Valve C Positions Sensor SENT digital read value	<25.00	Diagnostic is Enabled SENT communitation is not in error Run Crank Ignition in Range Engine not cranking Engine Diag System	 BRV_PstnSnsr_HBridge_LoC_FP = True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve D Position Sensor Circuit High (HEAT-BRV)	P29FB	Circuit Continuity This DTC detects a short to power in the position sensor signal circuit. This is accomplished by monitoring the reported position. If the position goes out of the expected range the DTC is set.	Engine Coolant Bypass Valve C Positions Sensor SENT digital read value	>1,654.00	Diagnostic is Enabled SENT communitation is not in error Run Crank Ignition in Range Engine not cranking Engine Diag System	 BRV_PstnSnsr_HBridge_LoC_FP = True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve E Position Sensor Circuit Low (HEAT - ORV)	P29FC	Circuit Continuity This DTC detects a short to ground in the position sensor signal circuit. This is accomplished by monitoring the reported position. If the position goes out of the expected range the DTC is set.	Engine Coolant Bypass Valve C Positions Sensor SENT digital read value	<25.00	Diagnostic is Enabled SENT communitation is not in error Run Crank Ignition in Range Engine not cranking Engine Diag System	 ORV_PstnSnsr_LoC_FP = True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve E Position Sensor Circuit High (HEAT-ORV)	P29FD	Circuit Continuity This DTC detects a short to power in the position sensor signal circuit. This is accomplished by monitoring the reported position. If the position goes out of the expected range the DTC is set.	Engine Coolant Bypass Valve C Positions Sensor SENT digital read value	>2,865.00	Diagnostic is Enabled SENT communitation is not in error Run Crank Ignition in Range Engine not cranking Engine Diag System	 ORV_PstnSnsr_LoC_FP = True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve E Motor Current High (HEAT-ORV)	P29FE	Controller specific output driver circuit detects an overcurrent condition in the load circuit for the Engine Coolant Bypass Valve E when the H-Bridge is energized.	Current measurement outside of controller specific acceptable range when H-Bridge is energized	8.1A<X< 12.8A	Diagnostic is Enabled Run Crank Ignition in Range Engine not cranking Engine Diag System Driver over current test not failed this key-cycle	 = True = True = Enabled ORV_MtrCurrLim_TFTKO	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Wastegate Position Sensor "A" Circuit Low	P2AB8	Detects a continuous or intermittent short low or open in eWG position circuit by monitoring the eWG position sensor percent Vref and failing the diagnostic when the eWG percent Vref is too low. This diagnostic only runs when powertrain relay voltage is high enough. In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A' is associated with engine bank 1.	Raw position value	< 1.0 %	Diagnostic enabled ********** Powertrain relay voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts **********	10 failures out of 12 samples 100ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Wastegate Position Sensor "A" Circuit High	P2AB9	Detects a continuous or intermittent short high in eWG position circuit by monitoring the eWG position sensor percent Vref and failing the diagnostic when the eWG percent Vref is too high. This diagnostic only runs when powertrain relay voltage is high enough. In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A' is associated with engine bank 1.	Raw position value	> 99.0 %	Diagnostic enabled ********** Powertrain relay voltage ********** Engine does not crank Diagnostic system not disabled	True ********** >=11.0 Volts **********	10 failures out of 12 samples 100ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 1 Injection Pulse Performance	P2B00	Diagnostic to determine if any of the commanded injection pulses for cylinder 1 was not delivered due to the injector pintle/ armature not moving. The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude Or Measured Voltage feedback converted to Injector Opening Magnitude	=< **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below)	= True = True	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 2 Injection Pulse Performance	P2B01	Diagnostic to determine if any of the commanded injection pulses for cylinder 2 was not delivered due to the injector pintle/ armature not moving. The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude Or Measured Voltage feedback converted to Injector Opening Magnitude	=< **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below)	= True = True	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 3 Injection Pulse Performance	P2B02	Diagnostic to determine if any of the commanded injection pulses for cylinder 3 was not delivered due to the injector pintle/ armature not moving. The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude Or Measured Voltage feedback converted to Injector Opening Magnitude	=< **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below)	= True = True	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cylinder 4 Injection Pulse Performance	P2B03	Diagnostic to determine if any of the commanded injection pulses for cylinder 4 was not delivered due to the injector pintle/ armature not moving. The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude Or Measured Voltage feedback converted to Injector Opening Magnitude	=< **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below)	= True = True	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Cylinder 1 Injection Pulse Performance	P2B08	Diagnostic to determine if any of the commanded injection pulses for cylinder 1 during catalyst warm up was not delivered due to the injector pintle/armature not moving. The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/ armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude Or Measured Voltage feedback converted to Injector Opening Magnitude	=< **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Catalyst Warm up enabled (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below)	= True = True = True	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Cylinder 2 Injection Pulse Performance	P2B09	Diagnostic to determine if any of the commanded injection pulses for cylinder 2 during catalyst warm up was not delivered due to the injector pintle/armature not moving. The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/ armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude Or Measured Voltage feedback converted to Injector Opening Magnitude	=< **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Catalyst Warm up enabled (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below)	= True = True = True	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Cylinder 3 Injection Pulse Performance	P2B0A	Diagnostic to determine if any of the commanded injection pulses for cylinder 3 during catalyst warm up was not delivered due to the injector pintle/armature not moving. The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/ armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude Or Measured Voltage feedback converted to Injector Opening Magnitude	=< **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Catalyst Warm up enabled (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below)	= True = True = True	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Cylinder 4 Injection Pulse Performance	P2B0B	Diagnostic to determine if any of the commanded injection pulses for cylinder 4 during catalyst warm up was not delivered due to the injector pintle/armature not moving. The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/ armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude Or Measured Voltage feedback converted to Injector Opening Magnitude	=< **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Catalyst Warm up enabled (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below)	= True = True = True	50.00 to 100.00 samples Continuous Cylinder event sample rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 5 Circuit Low	P2B2D	Circuit Continuity This DTC detects a short to ground in the a temperature sensor signal circuit or the temperature sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ 150°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr5 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NoUseAssg nmnt Temperature Sensor 5: CeEECR_e_NoUseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	< X Ohms X is equal to: Temp Sensor 1: 55 Ohms Temp Sensor 2: 48.0 Ohms Temp Sensor 3: 41.0 Ohms Temp Sensor 4: 55.0 Ohms Temp Sensor 5: 41.1 Ohms Temp Sensor 6: 48.0 Ohms Temp Sensor 7: 48.0 Ohms	Diagnostic is Enabled		5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 5 Circuit High	P2B2E	Circuit Continuity This DTC detects a short to high or open in a temperature signal circuit or the temperature sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ -60°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: RadCoolantTempSnsr Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	> X Ohms X is equal to: Temp Sensor 1: 175,000 Ohms Temp Sensor 2: 235,000 Ohms Temp Sensor 3: 355,000 Ohms Temp Sensor 4: 174,069 Ohms Temp Sensor 5: 354,669 Ohms Temp Sensor 6: 235,000 Ohms Temp Sensor 7: 235,000 Ohms	Diagnostic is Enabled Engine run time OR IAT min	 > 10.0 seconds > -20.0 °C	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Wastegate Position Sensor “A” Circuit Performance	P2B81	Detects a performance failure on the electronic wastegate actuator system withe the following diagnostic * Position deviation supervision In series applications, turbocharger 'A is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A is associated with engine bank 1.	Actuator is in Normal operation Abs(Position Error) for at least position error = target position - actual position	>10.00% > 1.0 sec	Diagnostic enabled ********** Engine not in crank mode Engiene is not in cold start conditions Diagnostic system not disabled Device control Component test not active Target position gradient in range (position setpoint in steady state conditions for minimum time)	True ********** >-50.00 [%/s] < 50.00 [%/s] for >= 1.00 [s]	25 failures out of 30 samples 100ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Pump Overspeed	P2B83	This DTC indicates a out of range high failure of the pump speed.	Actual pump speed	>= 5,000 rpm	Pump H/W present Diagnostic enabled ********** Powertrain relay voltage Or WCP direct connected too Batt ********** - Pump enabled - Engine does not crank - Diagnostic system not disabled - No Fault active ICP_CWP_LcFA ICP_CWP_Rsp_FoFA	True True ********** >=11.0 Volts False **********	6 failures out of 8 samples 1000ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Pump Underspeed	P2B84	This DTC indicates a out of range low failure of the pump speed.	Actual pump speed	< -115 rpm	Pump H/W present Diagnostic enabled ********** Powertrain relay voltage Or WCP direct connected too Batt ********** - Pump enabled - Engine does not crank - Diagnostic system not disabled - No Fault active ICP_CWP_LcFA ICP_CWP_Rsp_FoFA	True True ********** >=11.0 Volts False **********	6 failures out of 8 samples 1000ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump Underspeed	P2B85	The purpose of the performance diagnostic is to detect and report a failure of the component. If the enable criteria are met, the difference between the commanded speed and the component actual speed is calculated. An underspeed condition is when the commanded speed is greater than the component actual speed. The speed difference is filtered and when the difference is greater than the underspeed calibrated fault threshold, the diagnostic reports a FAIL. If filtered speed difference does not exceed the underspeed calibrated fault threshold, the diagnostic reports a PASS. The diagnostic will continue to report as long as the enablement criteria are met. There are two different failure criteria as the pump feedback speed is dependent on the system voltage.	Any of the following fail criteria is met: **Criterial:** Filtered (Pump Command Speed - Pump Feedback Speed) 12V System Voltage **Criteria 2:** Filtered (Pump Command Speed - Pump Feedback Speed) 12V System Voltage	**P2B85 Pump Underspeed Fail > Threshold** >= -9,999.00 V **P2B85 Pump Underspeed Fail Threshold Low > Voltage** < -9,999.00 V	Diagnostic is Enabled Difference in Pump Command Speed from previous data sample to present data sample ========== Any of the following criteria is met: **Criteria** 1: Calibration to use fault pending is TRUE PECR_EMP_SpeedOORL_FP PECR_EMP_SpeedOORH_FP **Criteria 2:** Calibration to use fault pending is FALSE If either condition is achieved PECR_EMP_SpeedOORL_FA AND PECR_EMP_SpeedOORL_TFTKO OR PECR_EMP_SpeedOORH_FA AND PECR_EMP_SpeedOORH_TFTKO ==========	<250.00 RPM for >=3.00 s = 1.00(1 is TRUE) = Not Active = 1.00 (0 is FALSE) = Not Active	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					PECR_MainCoolPmpSpd Act_Av PECR_MainCoolPmpSpd Act_Fol EECR_EngineInlet_FA Engine Inlet Coolant Temperature All of the following criteria are met for 12V System Voltage Pump Command Speed Pump Enable	= Not Active >= -40.00 °C **P2B85 26CE Pump Speed Performance** **> Initialization Delay** > 11.00 V (with hysteresis disable < 10.00 V) >= 300.00 RPM = True		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Wastegate A Position Exceeded Learning Limit	P2B93	This DTC indicates a failure that the close position learning of the electronic waste gate 'A' was not successful. The learned raw close position was out of the boundaries. In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A' is associated with engine bank 1.	eWG raw position ********** OR ********** Never learned a valid Close Position and Engine speed	>91.9% ********** ********** = FALSE > 1000 rpm	Diagnostic enabled when electronic waste gate is present.	True	on event	Type A, 1 Trips
			eWG raw position and eWG Stable condition detected: Position deviation Stable Time	<72.0% < 1.00 % >0.13sec	Diagnostic enabled when electronic waste gate is present. ********** Coolant Temperature ********** No DTCs:	True ********** ********** >=80.0 °C **********	on event	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Injection Pulse Performance	P2B95	Monitors injector pulses when the cold start emission reduction strategy is active by accumulating and determining the percentage of engine cycles that missed a pulse relative to the total number of pulses when multi pulse is active.	Injector voltage feedback is not able to detect an opening magnitude on any pulse for any cylinder Or Measured Voltage feedback converted to Injector Opening Magnitude on any pulse for any cylinder	=< **P2B96 - Opening Magnitude Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below) OBD Manufacturer Enable Counter To enable the diagnostic, the Cold Start Emission Reduction Strategy Must Be Active per the following: Catalyst Temperature AND Engine Coolant AND Engine Coolant AND Barometric Pressure In addition, Multi Pulse Strategy Is Enabled and Active Per the following: Engine Speed Accel Position Engine Run Time	= True = True = 0 < 500.00 degC > -12.00degC <= 66.00 degC >= 72.00 KPa >= 300.00 RPM <= 2,600.00 RPM <= 30.00 Pct < 36 seconds	Runs once per trip when the cold start emission reduction strategy is active and Dual Pulse is enabled and active. Frequency: 100ms Test completes after Dual Pulse is no longer active OR The first 500 engine cycles have been reached	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:			
					Catalyst Temperature	>= 800.00 degC		
					AND			
					Engine Run Time	>= 0.00 seconds		
					OR			
					Engine Run Time	> **P050D_P1400_CatalystLightOffExtendedEngineRunTimeExit** This Extended Engine run time exit table is a function of percent ethanol and Catmons NormRatioEWMA. Refer to "Supporting Tables" for details.		
					OR			
					Barometric Pressure	< 72.00 KPa		
					Multi Pulse Strategy will exit per the following:			
					Engine Speed	> 3,500.00 RPM		
					OR			
					Accel Position	> 60.00 Pct		
					Engine Run Time	>= 36 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Mulit Pulse Strategy will also exit if the any of the "Additional Dual Pulse Enabling Criteria" is not satisfied: "Additional Multi Pulse Enabling Criteria": Green Engine Enrichment Misfire Converter Protection strategy Engine Metal Overtemp strategy Fuel control state Output State Control DOD Or DFCO Power Enrichment Dynamic Power Enrichment Piston Protection Hot Coolant Enrichment Injector Flow Test General Enable DTC's Not Set:	 Not Enabled Not being requested Not being requested Open Loop Not being requested for fuel Not Active Not Active Not Active Not Active Not Active Not Active AcceleratorPedalFailure ECT_Sensor_FA IAT_SensorCircuitFA MnfdTempSensorCktFA CrankSensor_FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						FuelInjectorCircuit_FA MAF_SensorFA MAP_SensorFA AnyCamPhaser_TFTKO ClutchPstnSnsr FA 1AC_SystemRPM_FA IgnitionOutputDriver_FA TPS_FA VehicleSpeedSensor_FA FuelInjectorCircuit TFTK 0 FHPR_b_FRP_SnsrCkt_FA FHPR_b_FRP_SnsrCkt_TFTKO FHPR_b_PumpCkt_FA FHPR b PumpCkt TFTK 0 TransmissionEngagedState_FA EngineTorqueEstInaccurate FuelPumpRIyCktFA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injection Pulse Performance Global missing pulse diags	P2B96	Diagnostic to determine if any of the commanded injection pulses for any of the cylinders was not delivered due to the injector pintle/armature not moving (total engine based). The detection is based on the voltage flux feedback that occurs in the injector coil from the pintle/armature movement. The voltage feedback is measured in the ECM across the enable & command wires using an analog to digital converter.	Injector voltage feedback is not able to detect an opening magnitude on any pulse for any cylinder Or Measured Voltage feedback converted to Injector Opening Magnitude on any pulse for any cylinder	= **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude Misisng Pulse Fail Limit** => **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude 2 Misisng Pulse Fail Limit** = **P2B00 P2B01 P2B02 P2B03P2B96 P2B08 P2B09 P2B0A P2B0B-Opening Magnitude 2 Delta Misisng Pulse Fail Limit** (See supporting table)	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Ready (See Definition in Supporting Material below) Above Engine Temperature	= True = True >--30.000	100.00 Frequency: 100ms Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump Stuck/ Stalled	P2BA2	The purpose of the diagnostic is to detect and report a failure of the component. This diagnostic checks the commanded off state of the pump to ensure that it is not reporting an actual speed that would represent a commanded on state. If the enable criteria are met when the pump is commanded off, the actual speed is evaluated. If the actual speed is greater than the calibrated fault threshold, the diagnostic reports a FAIL. If the actual speed does not exceed the calibrated fault threshold, the diagnostic reports a PASS. The diagnostic will continue to report as long as the enablement criteria are met.	Pump Feedback Speed	>= 10.00 RPM	Diagnostic is Enabled 12V System Voltage PECR_MainCoolPmpSpd Act_Av PECR_MainCoolPmpSpd Act_Fol Any of the following criteria are met for a) Pump Enable b) Pump Command Speed in Range	 > 11.00 V (with hysteresis disable < 10.00 V) = Not Active >= 3.00 s = False 0.00 RPM to 4.00 RPM	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 5 Circuit Intermittent/ Erratic	P2BB5	Circuit Erratic This DTC detects large step changes in a temperature signal circuit or the temperature sensor. Allowable high and low limits are calculated for the next sample based on the previous sample and sensor time constant. If the sensor responds faster than should be possible the DTC is set.	Temperature step change: 1) postive step change is greater than calculated high limit OR 2) negitive step change is lower than calculated low limit. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr5 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt		Diagnostic is Enabled No Active DTC's	EECR_TS5_Erratic_TFTK 0 EECR_TS5_CktHiLo_FA	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6 The calculated high and low limits for the next reading use the following calibrations: Temperature Sensor 1: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 2: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 3: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 4: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 5: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 6: 1) Sensor time constant 2) Sensor low limit 3) Sensor hiqh limit	 7.6 seconds -60.0 °C 200.0 °C 3.3 seconds -60.0 °C 200.0 °C 4.3 seconds -60.0 °C 200.0 °C 5.7 seconds -60.0 °C 200.0 °C 4.5 seconds -60.0 °C 200.0 °C 4.7 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Temperature Sensor 7: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit *****Generic Example***** If the last temp reading was 90 °C, the Time constant was calibrated at 10 seconds, the low limit was calibrated to -80 °C and the high limit was calibrated to 200 °C the calculated limits are 101 °C and 73 °C. The next reading (after the 90 °C reading) must be between 73 °C and 101 °C to be valid. **********	7.3 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 6 Circuit Low	P2BB8	Circuit Continuity This DTC detects a short to ground in the a temperature sensor signal circuit or the temperature sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ 150°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr6 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NoUseAssg nmnt Temperature Sensor 5: CeEECR_e_NoUseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	< X Ohms X is equal to: Temp Sensor 1: 55 Ohms Temp Sensor 2: 48.0 Ohms Temp Sensor 3: 41.0 Ohms Temp Sensor 4: 55.0 Ohms Temp Sensor 5: 41.1 Ohms Temp Sensor 6: 48.0 Ohms Temp Sensor 7: 48.0 Ohms	Diagnostic is Enabled		5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 6 Circuit High	P2BB9	Circuit Continuity This DTC detects a short to high or open in a temperature signal circuit or the temperature sensor. This is accomplished by monitoring the resistance of the circuit. If the resistance goes out of the expected range the DTC is set.	ECT Resistance (@ -60°C) This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: RadCoolantTempSnsr Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6	> X Ohms X is equal to: Temp Sensor 1: 175,000 Ohms Temp Sensor 2: 235,000 Ohms Temp Sensor 3: 355,000 Ohms Temp Sensor 4: 174,069 Ohms Temp Sensor 5: 354,669 Ohms Temp Sensor 6: 235,000 Ohms Temp Sensor 7: 235,000 Ohms	Diagnostic is Enabled Engine run time OR IAT min	 > 10.0 seconds > -20.0 °C	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Temperature Sensor 6 Circuit Intermittent/ Erratic	P2BBA	Circuit Erratic This DTC detects large step changes in a temperature signal circuit or the temperature sensor. Allowable high and low limits are calculated for the next sample based on the previous sample and sensor time constant. If the sensor responds faster than should be possible the DTC is set.	Temperature step change: 1) postive step change is greater than calculated high limit OR 2) negitive step change is lower than calculated low limit. This program uses a highly confiurable sensor reading system. This DTC is associated with the temp sensor that is equal to: EngCoolantTempSnsr6 Temperature Sensor 1: CeEECR_e_EngCoolant TempSnsrl Temperature Sensor 2: CeEECR_e_EngCoolant TempSnsr2 Temperature Sensor 3: CeEECR_e_RadCoolant TempSnsr Temperature Sensor 4: CeEECR_e_NollseAssg nmnt Temperature Sensor 5: CeEECR_e_NollseAssg nmnt		Diagnostic is Enabled No Active DTC's	EECR_TS6_Erratic_TFTK 0 EECR_TS6_CktHiLo_FA	5 seconds out of a 6 seconds window Continuously sampled	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Temperature Sensor 6: CeEECR_e_EngCoolant TempSnsr5 Temperature Sensor 7: CeEECR_e_EngCoolant TempSnsr6 The calculated high and low limits for the next reading use the following calibrations: Temperature Sensor 1: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 2: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 3: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 4: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 5: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit Temperature Sensor 6: 1) Sensor time constant 2) Sensor low limit 3) Sensor hiqh limit	 7.6 seconds -60.0 °C 200.0 °C 3.3 seconds -60.0 °C 200.0 °C 4.3 seconds -60.0 °C 200.0 °C 5.7 seconds -60.0 °C 200.0 °C 4.5 seconds -60.0 °C 200.0 °C 4.7 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Temperature Sensor 7: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit *****Generic Example***** If the last temp reading was 90 °C, the Time constant was calibrated at 10 seconds, the low limit was calibrated to -80 °C and the high limit was calibrated to 200 °C the calculated limits are 101 °C and 73 °C. The next reading (after the 90 °C reading) must be between 73 °C and 101 °C to be valid. **********	7.3 seconds -60.0 °C 200.0 °C				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal Control Module SIDI High Pressure Pump min/ max authority During Catalyst Warm Up	P2C1E	This DTC determines when the high pressure pump control has reached to its max or min authority during Cataylst Warm up	High Pressure Fuel Pump Delivery Angle OR High Pressure Fuel Pump Delivery Angle	>= 92° <= 0°	Catalyst Warm Up High Pressure Pump Performance Diagnostic Enable Battery Voltage Low Side Fuel Pressure Barometric Pressure Inlet Air Temp Fuel Temp Catalyst Warm up enabled (See Definition in Supporting Material below) Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP orTFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) andCam or	True >=11 Volts > 0.300 MPa Enabled when a code clear is not active or not exiting device control Engine is not cranking >= 70.0 KPA >= -20.0 degC -20 <= Temp degC <= 126 = True	Windup High/ Low 10.00 seconds failures out of 12.50 Seconds samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true andManufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SIDI High Pressure Pump Performance During Catalyst Warm Up	P2C1F	This DTC determines if the high pressure pump is not able to maintain target pressure Catalyst Warm Up. The fault is set if the measured fuel rail pressure is lower than desired fuel pressure by a value that can impact emission and drivability for a number of pump events.	Fuel Pressure Error (Desired Pressure - Measure Pressure)	>= **P228C P2C1F-High Pressure Pump Control (HPC) fail threshold of pressure too low** Mpa (see supporting tables)	Catalyst Warm Up High Pressure Pump Performance Diagnostic Enable Battery Voltage Low Side Fuel Pressure Catalyst Warm up enabled (See Definition in Supporting Material below) Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP orTFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) andCam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and	True >=11 Volts > 0.300 MPa = True Enabled when a code clear is not active or not exiting device control Engine is not cranking	Positive Pressure Error - 10.00 second failures out of 12.50 second samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active Barometric Pressure Inlet Air Temp Fuel Temp	 >= 70.0 KPA >=-20.0 degC -20 <=Temp degC <= 126		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
SIDI High Pressure Pump Performance During Catalyst Warm Up	P2C20	This DTC determines if the high pressure pump is delivering high pressure that desired pressure Catalyst Warm Up. The fault is set if the measured fuel rail pressure is higher than desired fuel pressure by a value that can impact emission and drivability for a number of pump events.	Fuel Pressure Error (Desired Pressure - Measure Pressure)	<= **P228D P2C20 - High Pressure Pump Control (HPC) fail threshold for pressure too high** Mpa (see supporting tables)	Catalyst Warm Up High Pressure Pump Performance Diagnostic Enable Battery Voltage Low Side Fuel Pressure Catalyst Warm up enabled (See Definition in Supporting Material below) Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP orTFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not	True >=11 Volts >0.300 MPa = True Enabled when a code clear is not active or not exiting device control Engine is not cranking	Negative Pressure Error - 10.00 second failures out of 12.50 second samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true andManufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active Barometric Pressure Inlet Air Temp Fuel Temp	 >= 70.0 KPA >= -20.0 DegC -20 <= Temp degC <= 126		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Oil Temperature Sensor A/B Correlation	P2C21	Determines if one of the redundant oil temperature sensors is biased or stuck in range. Three independent tests can be used.1) Cold Start Test Compares EOT to ECT and IAT at powerup after a long soak (Fast and regular tests). 2) Warm Up Test Compares EOT to a target EOT after a large enough accumulated airflow has occurred. 3) Continuous Test Compares Sensor A to Sensor B.	**Fast Cold Start Test** <u>To indicate an fast fail:</u> Absolute value of Powerup EOT - Powerup ECT AND Absolute value of Powerup IAT - Powerup ECT <u>To indicate a fast pass:</u> Absolute value of Powerup EOT - Powerup ECT AND Absolute value of Powerup EOT - Powerup IAT	EOT Temp Diff > **FastFailTempDiff** (See P0196 details on Supporting Tables Tab) AND < 16 degrees C < 16 degrees C AND < 16 degrees C	EOT Diagnostic main Status AND Engine Running Cold Start Specific EOT Test Conditions: Use Cold Start Diagnostic Engine Off Time Engine Off Timer Validity No active DTC's	Enabled = True Enabled > 540 Seconds = True Fault bundles: IgnitionOffTimer_FA IAT_SensorFA ECT_Sensor_Ckt_FA MAF_SensorFA EngOilTempSensorCircuit FA	Cold Start Fast Test - one failure out of one sample - test performed once per second	Type B, 2 Trips
			Cold Start Test <u>Pass Condition 1:</u> Absolute value of Powerup EOT - Powerup ECT AND Absolute value of Powerup EOT - minIAT OR <u>Pass Condition 2:</u> Absolute value of Powerup EOT - Powerup ECT	<= 16 Deg C <= 16 Deg C OR > 16 Deg C	All three tests (Cold/ Warm/Continuous) EOT Diagnostic main enable AND Engine Running Cold Start Specific EOT Test Conditions: Use Cold Start Diagnostic Engine Off Time Engine Off Timer Validity	Enabled = True Enabled > 540 Seconds = True	Cold Start Regular Test - one failure out of one sample - test performed once per second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			AND (IAT minimum observed with Block Heater or (IAT minimum observed and Absolute value of power up IAT - min. observed IAT)) AND Absolute value of Powerup EOT - Powerup IAT AND Absolute value of Powerup EOT - minIAT <u>Fail Condition:</u> Absolute value of Powerup EOT - Powerup EOT AND (IAT minimum observed with Block Heater or (IAT minimum observed and Absolute value of power up IAT - min. observed IAT)) AND (Absolute value of Powerup EOT - Powerup IAT or Absolute value of Powerup EOT - minIAT) AND Absolute value of Powerup ECT - Powerup IAT	AND > -7 Deg C > -10 Deg C <= 5 Deg C AND <= 16 Deg C <= 16 Deg C > 16 Deg C AND > -7 Deg C > -10 Deg C <= 5 Deg C AND > 16 Deg C > 16 Deg C AND <= 16 Deg C	Time above Minimum Vehicle Speed Time less than Vehicle speed resets above timer No active DTC's	> 9 MPH for > 400 seconds < 15.0 for > 20.0 seconds Fault bundles: IgnitionOffTimer_FA IAT_SensorFA ECT_Sensor_Ckt_FA MAF_SensorFA EngOilTempSensorCircuit FA		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			AND Absolute value of Powerup ECT - minIAT	AND <= 16 Deg C				
			Warmup Test <u>Warm Up Fail Condition:</u> EOT <u>Warm Up Test Pass Condition:</u> EOT	 < 70 Deg C => 70 Deg C	EOT Diagnostic main enable Engine Running Warm Up EOT Test Specific Conditions: Use Warm Up EOT Diagnostic Power up ECT Power up ECT Total accumulated engine airflow since engine start DISABLE CONDITIONS (for all three tests)No active DTC's	Enabled = True Disabled > 200 degrees C < 200 degrees C >= **P0196_TotalAccumulatedFlow** (See P0196 details on Supporting Tables Tab) Fault bundles: IAT_SensorFA ECT_Sensor_Ckt_FA MAF_SensorFA EngOilTempSensorCircuitFA	Warm up Tests - one failure out of one sample - test performed once per second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Continuous Test Pass Condition: (Measured Oil Temperature A - Measured Oil Temperature B) OR Absolute value of (Measured Oil Temperature A - Measured Oil Temperature B) Fail Condition: (Measured Oil Temperature A - Measured Oil Temperature B) AND Absolute value of (Measured Oil Temperature A - Measured Oil Temperature B)	>= 0 and <= 15.8 OR >= 0 and <= 15.8 > 15.8 AND > 15.8	Redundant Sensor Enable EOT Diagnostic main Enable Engine Running Continuous EOT Test Specific Conditions: Power up ECT and ECT All of three criteria above AND EOT Model Oil Temperature reach Equilibrium OR Use quick transition to equilibrium state and ECT DISABLE CONDITIONS (for all three tests)No active DTC's	Enabled Enabled = True Enabled >= -7 and <= 105 Deg C >= 45 and <= 105 Deg C >= 70 Deg C Enabled and >= ECT from 5 sec previous Fault bundles: IAT_SensorFA ECT_Sensor_Ckt_FA MAF_SensorFA EngOilTempSensorCircuit FA IAT_SensorCircuitFA EngOilModeledTempValid	Continuous Test 8 failures out of 10 samples performed once per second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Wastegate Position SensorA Circuit Performance	P2C9B	Detects a performance failure on the electronic wastegate actuator system withe the following diagnostic * Position deviation supervision In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A' is associated with engine bank 1.	Actuator is in Normal operation Abs(Position Error) for at least position error = target position - actual position	>10.00% > 1.0 sec	Diagnostic enabled ********** Engine not in crank mode Engiene is not in cold start conditions Diagnostic system not disabled Device control Component test not active Target position gradient in range (position setpoint in steady state conditions for minimum time)	True ********** >-50.00 [%/s] < -50.00 [%/s] for >= 1.00 [s]	25 failures out of 30 samples 100ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve D Motor Current High (HEAT-BRV)	P2CF8	Controller specific output driver circuit detects an overcurrent condition in the load circuit for the Engine Coolant Bypass Valve D when the H-Bridge is energized.	Current measurement outside of controller specific acceptable range when H-Bridge is energized	8.1A<X< 12.8A	Diagnostic is Enabled Run Crank Ignition in Range Engine not cranking Engine Diag System Driver over current test not failed this key-cycle	 = True = True = Enabled BRV_HBridge_MtrCurrLim_TFTKO	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
LIN Generator Excitation Current Plausibility	P2DC7	This diagnostic detects a fault leading the LIN Generator measured excitation current to be not plausible considering rotor coil resistance estimation (estimated rotor coil resistance outside plausible range). Rotor coil resistance estimation is the ratio between LIN Generator excitation PWM duty cycle and battery voltage product and LIN Generator excitation current measurement.	LIN Generator rotor coil resistance estimation OR LIN Generator rotor coil resistance estimation	< 1.20 [Ohm] >3.60 [Ohm]	Calibration on diagnostic enabling Diagnostic system disabled (clear code in progress, diagnostic re-enable in progress or end of trip processing in progress) LIN Generator present and enabled Engine running System voltage low failure not present LIN Generator Excitation Current Stuck High failure not present LIN Generator Excitation Current Stuck Low failure not present LIN Generator commanded disabled LIN Generator feedback communication Data Ready	1.00==TRUE ==FALSE 1.00==TRUE ==TRUE LVT_SysVoltLowFA ==FALSE GEN_LIN_CurStkHiFA ==FALSE GEN_LIN_CurStkLoFA ==FALSE ==FALSE ==TRUE	Enabling conditions shall be verified for 1.00 [s] before definitely enabling the diagnostic 160.00 fail counts out of 200.00 sample counts Functional task: 25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					LIN Generator feedback communication Fault Active	==FALSE		
					LIN Generator feedback communication Fault Pending	==FALSE		
					Mask function of voltage setpoint override source enumeration (each cal bit represents an override that shall be set to TRUE to enable the monitor during that particular override)	41,417,983.00		
					Filtered LIN Generator excitation PWM duty cycle and battery voltage product in steady state condition	<=0.39[V] AND NOT > 0.45 [V]		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
LIN Generator Excitation Current Stuck Low	P2DC8	This diagnostic detects a fault leading the LIN Generator measured excitation current to be stuck below a calibratable minimum threshold.	LIN Generator measured excitation current	<= 0.05 [A]	Calibration on diagnostic enabling	1.00==TRUE	160.00 fail counts out of 200.00 sample counts	Type B, 2 Trips
					Diagnostic system disabled (clear code in progress, diagnostic re-enable in progress or end of trip processing in progress)	==FALSE	Functional task: 25 ms	
					LIN Generator present and enabled	1.00==TRUE		
					Engine running	==TRUE		
					System voltage low failure not present	LVT_SysVoltLowFA ==FALSE		
					LIN Generator commanded disabled	==FALSE		
					LIN Generator feedback communication Data Ready	==TRUE		
					LIN Generator feedback communication Fault Active	==FALSE		
					LIN Generator feedback communication Fault Pending	==FALSE		
					Voltage setpoint override	Not equal to Startup,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					source Mask function of voltage setpoint override source enumeration (each cal bit represents an override that shall be set to TRUE to enable the monitor during that particular override)	AutoSS or StallSaver 41,417,983.00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
LIN Generator Excitation Current Stuck High	P2DC9	This diagnostic detects a fault leading the LIN Generator measured excitation current to be stuck over a calibratable maximum threshold.	LIN Generator measured excitation current	>= 8.00 [A]	Calibration on diagnostic enabling	1.00==TRUE	160.00 fail counts out of 200.00 sample counts	Type B, 2 Trips
					Diagnostic system disabled (clear code in progress, diagnostic re-enable in progress or end of trip processing in progress)	==FALSE	Functional task: 25 ms	
					LIN Generator present and enabled	1.00==TRUE		
					System voltage low failure not present	LVT_SysVoltLowFA ==FALSE		
					LIN Generator commanded disabled	==FALSE		
					LIN Generator feedback communication Data Ready	==TRUE		
					LIN Generator feedback communication Fault Active	==FALSE		
					LIN Generator feedback communication Fault Pending	==FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Engine Coolant Bypass Valve C Range/ Performance (HEAT-RRV)	P2DE7	This DTC will detect when the valve cannot achieve the desired position within a calibrated threshold (degrees (angle)) after the Target position has stabilized for a calibratable amount of time or is moving slower than a calibratable rate. A failure of this diagnostic would indicate a slow or stuck part.	Absolute position deviation between target and actual	> 12.00 Degrees	Diagnostic is Enabled Coolant system mode Catalyst Warmup Enabled No DTCs Closed Loop position control Desired Position Gradient is stable Valve anti-sticking routine Engine Diag System Engine not cranking Run Crank Ignition in Range Engine Outlet Coolant AND Engine Outlet Coolant is not faulted OR OBD Coolant Enable Criteria	 = Low Flow or Low Flow Autostop = TRUE EECR_EngineOutlet_FA RRV_PstnSnsr_FA = Active = TRUE = Inactive = Enabled = True = True > -39.00 °C = TRUE = TRUE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Engine Coolant Pump Underspeed	P2DE9	The purpose of the performance diagnostic is to detect and report a failure of the component. If the enable criteria are met, the difference between the commanded speed and the component actual speed is calculated. An underspeed condition is when the commanded speed is greater than the component actual speed. The speed difference is filtered and when the difference is greater than the underspeed calibrated fault threshold, the diagnostic reports a FAIL. If filtered speed difference does not exceed the underspeed calibrated fault threshold, the diagnostic reports a PASS. The diagnostic will continue to report as long as the enablement criteria are met. There are two different failure criteria as the pump feedback speed is dependent on the system voltage.	Pump speed request - Pump speed feedback	>200 RPM	Diagnostic is Enabled Coolant system mode Catalyst Warmup Enabled Difference in Pump Command Speed from previous data sample to present data sample ========== EECR_EngineInlet_FA Engine Inlet Coolant Temperature ========== Any of the following criteria is met: Criteria 1: Calibration to use fault pending is TRUE PECR_EMP_SpeedOORL_FP PECR_EMP_SpeedOORH_FP Criteria 2: Calibration to use fault pending is FALSE If either condition is achieved PECR_EMP_SpeedOORL_FA AND	= Low Flow or Low Flow Autostop = TRUE <250.00 RPM for >=3.00 s = Not Active >= -40.00 °C = 1.00(1 is TRUE) = Not Active = 1.00 (0 is FALSE)	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					PECR_EMP_SpeedOORL_TFTKO OR PECR_EMP_SpeedOORH_FA AND PECR_EMP_SpeedOORH_TFTKO	= Not Active = Not Active		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Gear Lever Position Sensor 1 Performance	P2E01	Detects sensor internal error in SENT1	Gear Lever Position Measured Alpha1/Beta1 on Sensor 1	>= 99.84 %	Not Fault Active (no Lost Comm FP & no Invalid Data FP) Diagnostic Enable Calibration	U1191,1195 U13E0.U13E2 1.00	160.00 failures out of 200.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Gear Lever Position Sensor 2 Performance	P2E05	Detects sensor internal error in SENT2	Gear Lever Position Measured Alpha 2/Beta2 on Sensor 2	>= 99.84 %	Not Fault Active (no Lost Comm FP & no Invalid Data FP)) Diagnostic Enable Calibration	U1194, U1196 U13E1, U13E3 1.00	160.00 failures out of 200.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Bypass Valve E Range/ Performance (HEAT-ORV)	P2E66	This DTC will detect when the valve cannot achieve the desired position within a calibrated threshold (degrees (angle)) after the Target position has stabilized for a calibratable amount of time or is moving slower than a calibratable rate. A failure of this diagnostic would indicate a slow or stuck part.	Absolute position deviation between target and actual	> 12.00 Degrees	Diagnostic is Enabled No DTCs Closed Loop position control Desired Position Gradient is stable Valve anti-sticking routine Engine Diag System Engine not cranking Run Crank Ignition in Range Engine Outlet Coolant AND Engine Outlet Coolant is not faulted OR OBD Coolant Enable Criteria	ORV_PstnSnsr_LoC_FA 0 RV_PstnSnsr_FA = Active = TRUE = Inactive = Enabled = True = True > -39.00 °C = TRUE = TRUE	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cold Start Engine Coolant Pump Overspeed	P2E82	The purpose of the performance diagnostic is to detect and report a failure of the component. If the enable criteria are met, the difference between the commanded speed and the component actual speed is calculated. An overspeed condition is when the commanded speed is less than the component actual speed. The speed difference is filtered and when the difference is less than the overspeed calibrated fault threshold, the diagnostic reports a FAIL. If filtered speed difference does not exceed the overspeed calibrated fault threshold, the diagnostic reports a PASS. The diagnostic will continue to report as long as the enablement criteria are met. There are two different failure criteria as the pump feedback speed is dependent on the system voltage.	Pump speed request - Pump speed feedback	< -200 RPM	Diagnostic is Enabled Coolant system mode Catalyst Warmup Enabled Difference in Pump Command Speed from previous data sample to present data sample ========== EECR_EngineInlet_FA Engine Inlet Coolant Temperature ========== Any of the following criteria is met: Criteria 1: Calibration to use fault pending is TRUE PECR_EMP_SpeedOORL_FP PECR_EMP_SpeedOORH_FP Criteria 2: Calibration to use fault pending is FALSE If either condition is achieved PECR_EMP_SpeedOORL_FA AND	= Low Flow or Low Flow Autostop = TRUE <250.00 RPM for >=3.00 s = Not Active >= -40.00 °C = 1.00(1 is TRUE) = Not Active = 1.00 (0 is FALSE)	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					PECR_EMP_SpeedOORL_TFTKO OR PECR_EMP_SpeedOORH_FA AND PECR_EMP_SpeedOORH_TFTKO	= Not Active = Not Active		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DC/DC Converter Crank Control Circuit High Voltage	P305D	Diagnoses the DC/DC Converter Crank Control Circuit for circuit high faults	DC/DC Converter Crank Control	<> ECM Crank Control	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) ECM Crank Control Battery Voltage	1 1 TRUE TRUE FALSE FALSE >= 6.60 Volts	320 failed samples out of 400 samples in 12.50 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
DC/DC Converter Crank Control Circuit Low Voltage	P305E	Diagnoses the DC/DC Converter Crank Control Circuit for circuit low faults	DC/DC Converter Crank Control	<> ECM Crank Control	Diagnostic enabled If Global B electrical architecture Then (Run/Crank or Accessory) Else (Sensor Bus Relay On AND Sensor Bus Relay Fault Active) ECM Crank Control Battery Voltage	1 1 TRUE TRUE FALSE TRUE >= 6.60 Volts	26 failed samples out of 30 samples in 12.50 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump Speed Out of Range Low	P3071	This diagnostic detects if the actual speed is out of range low. If the enable criteria are met and the actual speed is below a calibrated threshold, the fail counter will increment. If the calibrated fail count threshold is met before the calibrated sample count, the diagnostic will report a FAIL and if not it will report a PASS. The diagnostic will continue to report as long as the enablement criteria are met.	Pump Feedback Speed	<= -10.00RPM	Diagnostic is Enabled All of the following criteria are met for 12V System Voltage PECR_MainCoolPmpSpdAct_Av PECR_MainCoolPmpSpdAct_Fol	 >= 3.00 s > 11.00 V (with hysteresis disable < 10.00 V) = Not Active	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump Speed Out of Range High	P3072	This diagnostic detects if the actual speed is out of range high. If the enable criteria are met and the actual speed is above a calibrated threshold, the fail counter will increment. If the calibrated fail count threshold is met before the calibrated sample count, the diagnostic will report a FAIL and if not it will report a PASS. The diagnostic will continue to report as long as the enablement criteria are met.	Pump Feedback Speed	>= 6,350.00 RPM	Diagnostic is Enabled All of the following criteria are met for 12V System Voltage PECR_MainCoolPmpSpdAct_Av PECR_MainCoolPmpSpdAct_Fol	 >= 3.00 s > 11.00 V (with hysteresis disable < 10.00 V) = Not Active	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump Current Out of Range Low	P3073	This diagnostic detects if the actual motor current is out of range low. If the enable criteria are met and the actual current is below a calibrated threshold, the fail counter will increment. If the calibrated fail count threshold is met before the calibrated sample count, the diagnostic will report a FAIL and if not it will report a PASS. The diagnostic will continue to report as long as the enablement criteria are met. There are two different failure criteria depending on the pump commanded state (ON, OFF), however one time window is used to mature the diagnostic, and is not independent for each commanded state.	Pump Motor AC Current	< 0.00A	Diagnostic is Enabled 12V System Voltage PECR_MainCoolPmpMtrACC_Av PECR_MainCoolPmpMtrACC_Fol	 > 11.00 V (with hysteresis disable < 10.00 V) = Not Active	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump Current Out of Range High	P3074	This diagnostic detects if the actual motor current is out of range high. If the enable criteria are met and the actual current is above a calibrated threshold, the fail counter will increment. If the calibrated fail count threshold is met before the calibrated sample count, the diagnostic will report a FAIL and if not it will report a PASS. The diagnostic will continue to report as long as the enablement criteria are met.	Pump Motor AC Current	>= 80.00 A	Diagnostic is Enabled 12 System Voltage PECR_MainCoolPmpMtrACC_Av PECR_MainCoolPmpMtrACC_Fol	 > 11.00 V (with hysteresis disable < 10.00 V) = Not Active	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump Low Current Performance	P3075	The current performance diagnostic detects and reports failure of the pump or the cooling system flow. The diagnostic consists of an intrusive test performed each drive cycle if the necessary enable conditions are met and a passive test that runs continuously when the intrusive test is not executing. Only the intrusive test can report a diagnostic fail or pass result. Pump low current condition is when the actual electrical current is less than the expected electrical current for the reported pump speed. If the enable criteria are met, the intrusive test controls the pump to a calibratable speed for a calibratable time, during this time, if the actual current is less than the low current calibration failure threshold, the diagnostic reports a FAIL. If the actual current does not fall below the low current calibration failure threshold, the	Intrusive Test: Any of the following criteria is met Criteria 1: **P3075 3076 Pump** a) **Current Scaled** (A) b) EECR_EngineInlet F A is Not Active Criteria 2: a) Pump Motor AC Current (See supporting tables for the above threshold values) The intrusive test runs at least once every drive cycle, but may be enabled again if the passive test has determined a potential failure after the intrusive diagnostic has passed.	 < **P3075 Pump Low Current Performance Failure Threshold** (A) (See supporting tables for the above threshold values)	Diagnostic is Enabled 12V System Voltage PECR_MainCoolPmpMtrACC_Av PECR_MainCoolPmpMtrACC_FoI PECR_MainCoolPmpSpdAct_Av PECR_MainCoolPmpSpdAct_FoFA PECR_MainCoolPmpSpdAct_FoI PECR_MainCoolPmpSpdAct_LcFA PECR_EMP_CurrOORL_FA PECR_EMP_CurrOORH_FA PECR_EMP_SpdBndl_FA PECR_EMP_CurrPerfLo_TFTKO PECR_EMP_CurrPerfHi_TFTKO VECR_BRV_Ckt_FA VECR_BRV_Performance_FA VECR_MRV_ActrFA EECR_EngineOutlet_FA Pump Enable Engine Block Valve Coolant Flow in Range Coolant Flow Restriction Factor in Range Pump Intrusive Test Timer Pump Speed Feedback in	 >= 10.20 V = Not Active = True 20.00 to 100.00% 0.20 to 1.00 < 15.00 s	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		diagnostic reports a PASS.			Range	3,800.00 RPM to 4,200.00 RPM		
					All of the following criteria are met for	>= 2.00 s		
					a) Coolant Distribution Mode (Criteria is met when the array table for the given distribution mode is TRUE)	**P3075 3076 Pump Current Performance Coolant Distribution =Mode** (1 is TRUE)		
					b) Coolant System Mode (Criteria is met when the array table for the given distribution mode is TRUE)	**P3075 3076 Pump Current Performance Coolant System Mode =Select** (1 is TRUE)		
					Any of the following criteria is met for Criteria 1:	>= 2.00 s		
					a) Passive Test Result	= Fail		
					b) Desired Air Per Cylinder	> 100.00 mg (with hysteresis disable <80.00 mg)		
					Criteria 2:			
					a) Passive Test Result	= Not Fail		
					b) Desired Air Per Cylinder	> 100.00 mg (with hysteresis disable < 80.00 mg)		
					Any of the following criteria is met: Criteria 1:			
					a)			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					PECR_EMP_CurrPerf Hi_TPTKO PECR_EMP_CurrPerf Lo_TPTKO	= Not Active		
					b) Pump Intrusive Test Attempts	<= 3.00 Count		
					Criteria 2: a) Passive Test Result	= Fail		
					b) Pump Passive Requests	<= 3.00 Count		
					Any of the following criteria is met: a) Engine Outlet Coolant Temperature	>= 50.00 °C		
					b) OBD Coolant Enable	= True		
			Passive Test: Pump Motor AC Current The passive test has fewer enable conditions than the intrusive, and is disabled while the intrusive test runs. The passive test monitors the reported current at any given pump speed and flow restriction. Flow restriction is calculated	<= **P3075 Pump Low Current Passive Test Fail Threshold** (A) (See supporting tables for the above threshold values)	Diagnostic is Enabled 12V System Voltage PECR_MainCoolPmpMtr ACC_Av PECR_MainCoolPmpMtr ACC_Fol PECR_MainCoolPmpSpd Act_Av PECR_MainCoolPmpSpd Act_FoFA PECR_MainCoolPmpSpd Act_Fol PECR_MainCoolPmpSpd Act_LcFA PECR_EMP_CurrOORL_ FA PECR_EMP_CurrOORH_ FA	>= 10.20 V	8 seconds out of a 10 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			based on the current system valve configuration and pump speed. If the passive test determines a potential fault, then the intrusive test is re-enabled. All of the intrusive enable conditions must still be met prior to executing the intrusive test and making a diagnostic pass/fail decision.		PECR_EMP_SpdBndl_FA PECR_EMP_CurrPerfLo_TFTKO PECR_EMP_CurrPerfHi_TFTKO VECR_BRV_Ckt_FA VECR_BRV_Performance_FA VECR_MRV_ActrFA EECR_EngineOutlet_FA	= Not Active		
					Pump Enable	= True		
					Pump Intrusive Test Override	= Not Active		
					Difference in Pump Command Speed from previous data sample to present data sample	<50.00 RPM for >= 3.00 s		
					Pump Speed Feedback in Range	810.00 RPM to 6,250.00 RPM for >=2.00 s		
					Any of the following criteria is met: a) Engine Outlet Coolant Temperature	>=50.00 °C		
					b) OBD Coolant Enable	= True		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Engine Coolant Pump High Current Performance	P3076	The current performance diagnostic detects and reports failure of the pump or the cooling system flow. The diagnostic consists of an intrusive test performed each drive cycle if the necessary enable conditions are met and a passive test that runs continuously when the intrusive test is not executing. Only the intrusive test can report a diagnostic fail or pass result. Pump high current condition is when the actual electrical current is greater than the expected electrical current for the reported pump speed. If the enable criteria are met, the intrusive test controls the pump to a calibratable speed for a calibratable time, during this time, if the actual current is greater than the high current calibration failure threshold, the diagnostic reports a FAIL. If the actual current does not exceed the high current calibration failure threshold, the	Intrusive Test Any of the following criteria is met Criteria 1: **P3075 3076 Pump** a) **Current Scaled** (A) b) EECR_EngineInlet_FA is Not Active Criteria 2: a) Pump Motor AC Current (See supporting tables for the above threshold values) The intrusive test runs at least once every drive cycle, but may be enabled again if the passive test has determined a potential failure after the intrusive diagnostic has passed.	>**P3076 Pump High Current Performance Failure Threshold** (A) (See supporting tables for the above threshold values)	Diagnostic is Enabled 12V System Voltage PECR_MainCoolPmpMtrACC_Av PECR_MainCoolPmpMtrACC_FoI PECR_MainCoolPmpSpdAct_Av PECR_MainCoolPmpSpdAct_FoFA PECR_MainCoolPmpSpdAct_FoI PECR_MainCoolPmpSpdAct_LcFA PECR_EMP_CurrOORL_FA PECR_EMP_CurrOORH_FA PECR_EMP_SpdBndl_FA PECR_EMP_CurrPerfLo_TFTKO PECR_EMP_CurrPerfHi_TFTKO VECR_BRV_Ckt_FA VECR_BRV_Performance_FA VECR_MRV_ActrFA EECR_EngineOutlet_FA Pump Enable Engine Block Valve Coolant Flow in Range Coolant Flow Restriction Factor in Range Pump Intrusive Test Timer Pump Speed Feedback in	>= 10.20 V = Not Active = True 20.00 to 100.00% 0.20 to 1.00 < 15.00 s	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		diagnostic reports a PASS.			Range	3,800.00 RPM to 4,200.00 RPM		
					All of the following criteria are met for	>= 2.00 s		
					a) Coolant Distribution Mode (Criteria is met when the array table for the given distribution mode is TRUE)	**P3075 3076 Pump Current Performance Coolant Distribution =Mode** (1 is TRUE)		
					b) Coolant System Mode (Criteria is met when the array table for the given distribution mode is TRUE)	**P3075 3076 Pump Current Performance Coolant System Mode =Select** (1 is TRUE)		
					Any of the following criteria is met for	>= 2.00 s		
					Criteria 1: a) Passive Test Result	= Fail		
					b) Desired Air Per Cylinder	> 100.00 mg (with hysteresis disable <80.00 mg)		
					Criteria 2: a) Passive Test Result	= Not Fail		
					b) Desired Air Per Cylinder	> 100.00 mg (with hysteresis disable < 80.00 mg)		
					Any of the following criteria is met:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Criteria 1: a) PECR_EMP_CurrPerf Hi_TPTKO PECR_EMP_CurrPerf Lo_TPTKO b) Pump Intrusive Test Attempts Criteria 2: a) Passive Test Result b) Pump Passive Requests Any of the following criteria is met: a) Engine Outlet Coolant Temperature b) OBD Coolant Enable	= Not Active <= 3.00 Count = Fail <= 3.00 Count >= 50.00 °C = True		
			Passive Test: Pump Motor AC Current The passive test has fewer enable conditions than the intrusive, and is disabled while the intrusive test runs. The passive test monitors the reported current at any given pump speed	>= **P3076 Pump High Current Passive Test Fail Threshold** (A) (See supporting tables for the above threshold values)	Diagnostic is Enabled 12V System Voltage PECR_MainCoolPmpMtr ACC_Av PECR_MainCoolPmpMtr ACC_FoI PECR_MainCoolPmpSpd Act_Av PECR_MainCoolPmpSpd Act_FoFA PECR_MainCoolPmpSpd Act_FoI PECR_MainCoolPmpSpd Act_LcFA PECR_EMP_CurrOORL_ FA	>= 10.20 V	8 seconds out of a 10 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			and flow restriction. Flow restriction is calculated based on the current system valve configuration and pump speed. If the passive test determines a potential fault, then the intrusive test is re-enabled. All of the intrusive enable conditions must still be met prior to executing the intrusive test and making a diagnostic pass/fail decision.		PECR_EMP_CurrOORH_FA PECR_EMP_SpdBndl_FA PECR_EMP_CurrPerfLo_TFTKO PECR_EMP_CurrPerfHi_TFTKO VECR_BRV_Ckt_FA VECR_BRV_Performance_FA VECR_MRV_ActrFA EECR_EngineOutlet_FA	= Not Active		
					Pump Enable	= True		
					Pump Intrusive Test Override	= Not Active		
					Difference in Pump Command Speed from previous data sample to present data sample	<50.00 RPM for >= 3.00 s		
					Pump Speed Feedback in Range	810.00 RPM to 6,250.00 RPM for >=2.00 s		
					Any of the following criteria is met: a) Engine Outlet Coolant Temperature	>=50.00 °C		
					b) OBD Coolant Enable	= True		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Pump Motor Current Out Of Range High	P30AE	This DTC indicates a out of range high failure of the pump motor current.	Actual Motor Current	> 12.00 A	Pump H/W present Diagnostic enabled ********** Actual pump speed ********** Powertrain relay voltage Or WCP direct connected too Batt (Coolant Temp OR OBD Coolant enable Criteria) AND (Coolant Temp OR OBD max Coolant Temp achieved) ********** - Pump enabled - Engine does not crank - Diagnostic system not disabled - No Fault active ICP_CWP_LcFA ICP_CWP_Rsp_FoFA	True True ********** > 1,000 rpm ********** >=11.0 Volts False >10.00C =TRUE <= 126.00 C =FALSE **********	8 failures out of 10 samples 1000ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Charge Air Cooler Coolant Pump Motor Current Out Of Range Low	P30AF	This DTC indicates a out of range low failure of the pump motor current. Two fault paths are considered. When pump is commanded with pump speed > 0 and commanded pump speed = 0.	Actual Motor Current For more than	< -0.10 A > 5.00 sec	Pump H/W present Diagnostic enabled ********** Actual pump speed ********** Powertrain relay voltage Or WCP direct connected too Batt (Coolant Temp OR OBD Coolant enable Criteria) AND (Coolant Temp OR OBD max Coolant Temp achieved) ********** - Pump enabled - Engine does not crank - Diagnostic system not disabled - No Fault active ICP_CWP_LcFA ICP_CWP_Rsp_FoFA	True True ********** > 1,000 rpm ********** >=11.0 Volts False >10.00C =TRUE <= 126.00 C =FALSE **********	8 failures out of 10 samples 1000ms /sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Injector Circuit Range/ Performance	P30D4	Diagnostic to determine if any of the voltage feedback measured from the analog to digital converter on any cylinder is rational (total engine based). The measured voltage is checked when the injection pulse width is large enough ensuring the injector pintle has achieved max travel and the injector voltage flux through the coil has reach the max stabilization limit.	Injector voltage feedback is not able to detect an opening magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Measured Voltage feedback converted to Injector Opening Magnitude OR Injector voltage feedback is not able to detect a closing time OR Measured Voltage feedback converted to Injector closing time OR Measured Voltage	= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Opening Magnitude** (See supporting table) >= **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Opening Magnitude** (See supporting table) = **P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Closing Time** (See supporting table) >=	Small Pulse General Diagnostic Enable (See Definition in Supporting Material below) Fuel Pulse Voltage Feedback Data Valid (See Definition in Supporting Material below) Injection Pulse Width	= True >= **P02EE P02EF P02F0 P02F1P30D4- Voltage Feedback Rationalities Minimum Pulse Width**	2.50 Second Fail count out of 10.00 seconds Samples Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			feedback converted to Injector closing time	**P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Closing Time** (See supporting table)				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 1	P30D6	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor.		Run/Crank voltage	>=6.41 Volts, else the failure will be reported for all conditions	In the primary processor, 8/16 counts intermittent 12.5 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 2	P30D7	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor.		Run/Crank voltage	>=6.41 Volts, else the failure will be reported for all conditions	In the primary processor, 8/16 counts intermittent 12.5 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 3	P30D8	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor.		Run/Crank voltage	>=6.41 Volts, else the failure will be reported for all conditions	In the primary processor, 8/16 counts intermittent 12.5 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 4	P30D9	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor.		Run/Crank voltage	>=6.41 Volts, else the failure will be reported for all conditions	In the primary processor, 8/16 counts intermittent 12.5 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 5	P30DA	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor.		Run/Crank voltage	>=6.41 Volts, else the failure will be reported for all conditions	In the primary processor, 8/16 counts intermittent 12.5 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 6	P30DB	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor.		Run/Crank voltage	>=6.41 Volts, else the failure will be reported for all conditions	In the primary processor, 8/16 counts intermittent 12.5 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 7	P30DC	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor.		Run/Crank voltage	>=6.41 Volts, else the failure will be reported for all conditions	In the primary processor, 8/16 counts intermittent 12.5 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Serial Peripheral Interface Bus 8	P30DD	This DTC detects intermitent and continuous invalid SPI messages. This is based on the detection of missing or invalid receive message within the main processor before receiving a valid message.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor.		Run/Crank voltage	>=6.41 Volts, else the failure will be reported for all conditions	In the primary processor, 8/16 counts intermittent 12.5 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan 1 Out of Range Low [LIN Bus Electric/ PWM Fans Only- Internal or External controller]	P30EE	This diagnostic is to determine if the fan speed feedback is incorrect. This is determined by measuring if the reported actual fan speed (in RPM) exceeds a lower limit for the fan speed, indicating that there is a failure of the measurement of the fan speed. If the measured fan speed exceeds the lower limit for an extended period of time so that a standard X of Y Figure of Merit matures, then the DTC is set.	Measured LIN Fan1 Speed must exceed a lower limit value to ensure measured feed speed is within an acceptable range	< = -110.00 rpm	a] Diagnostic Enabled b] Diagnostic System Disabled(via service tool) c] Battery Voltage In Range d] LIN Bus based Fan Operation Enabled e] LIN Serial data Lost communication Fault Active [DTC: U063200] f] LIN Serial data Continuous Operation Fault Active [DTCP135C]	a] = 1 [True if 1; False if 0] b] = FALSE c] = TRUE d] = TRUE e] = FALSE f] = FALSE	16.00 failures out of 20.00 samples; 1000 ms/ sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan 1 Out of Range High [LIN Bus Electric PWM Fans Only- Internal or External controller]	P30EF	This diagnostic is to determine if the fan speed feedback is incorrect. This is determined by measuring if the reported actual fan speed (in RPM) is below an upper limit for the fan speed, indicating that there is a failure of the measurement of the fan speed. If the measured fan speed exceeds the upper limit for an extended period of time so that a standard X of Y Figure of Merit matures, then the DTC is set.	Measured LIN Fan1 Speed must be below an upper limit value to ensure measured feed speed is within an acceptable range	> = 4,000.00 rpm	a] Diagnostic Enabled b] Diagnostic System Disabled(via service tool) c] Battery Voltage In Range d] LIN Bus based Fan Operation Enabled e] LIN Bus Lost Communication Fault Active [DTC U063200] f] LIN Bus serial data Continuous Operation Fault Active [DTCP135C]	a] = 1 [True if 1; False if 0] b] =FALSE c] =TRUE d] == TRUE e] =FALSE f] =FALSE	16.00 failures out of 20.00 samples; 1000 ms/ sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
P3186 (Internal Control Module Security Peripheral Performance)	P3186	This DTC indicates the security peripheral has experienced an internal fault indicating that MAC verification results are unreliable.	MAC verification has falsely passed a configurable number of times.	3.00	Calibration enable	= 1.00 Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Performance - Under Pressure	P3187	This DTC detects degradation in the performance of the electronically regulated fuel system by calculating the difference between the sensed, filtered system [line] pressure versus the ECM-commanded pressure [error calculation]. The calculated error is then compared to calibrated fault threshold tables for a fault decision.	Sensed Filtered Fuel System [line] pressure error	> Threshold [Supporting Table] **P3187_Threshold**	a) Diagnostic is .. b) Timer - Engine Running Minimum c1) Fuel Flow Rate Valid c2) Ambient Air Pressure Value Defaulted c3) Fault bundle FDB_FuelPresSnsrCktFA c4) Reference Voltage Fault Status [DTC P0641] c5) Exhaust AfterTreatment Fuel Injector A Control Circuit Short Low Fault [DTC P20CD] c6) Fuel Pres Sensor Performance Fault Active [DTC P018B] c7) Use Calculated Flow Performance Fault Thresholds c8) Engine Speed Status Valid c9) Fault bundle FAB_FuelPmpCktFA c10) Fuel Control Enable Fault Active [DTC P12A6] c11) Fuel Pump Driver Module OverTemp Fault	a) Enabled b) >= 30.00 seconds c1)== TRUE c2) == False c3) == False c4) == False c5) == False c6) == False c7) == False c8] ==TRUE c9] == False c10) == False d 1) == False	1 sample/ 12.5 millisec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Active [DTC P1255]			
					c12) Fuel Pump Speed Fault Active [DTCP129F]	c12) == False		
					c13) CAN Sensor Bus message $0C3 Comm Fault [DTCP165C]	c13) ––False		
					c14) CAN Sensor Bus Fuel Pmp Spd Command ARC and Checksum Comm Fault Code [DTC U18A7]	c14] == False		
					c15) Sensor Configuration [is Wired To FTZM?]	c15) == CeFDBR_e_WiredTo_FTZM		
					c16) Sensor Bus Relay On	c16) == TRUE		
					d) Emissions Fuel Level Low [Message $3FB]	d) == False		
					e) Fuel Control Enable	e) == TRUE		
					f) Fuel Pump Control State	f) == normal		
					g) Input circuit minimum voltage	g) >= 9.00 volts		
					h) High Pres Fuel Pump Mode Management Active	h) == False		
					j) High Pres Fuel Pump Control Mode	j) == Not Disabled Mode AND == Not ZeroFlow Mode		
					ml) Fuel Pmp Speed Command Alive Rollina	ml) == False		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Count and Checksum Error [CAN Bus C $0CE] [DTC P14CD] m2) CAN Sensor Bus message $0C3 Available m3) Fuel Pres Sensor Ref Voltage Status Message Counter Incorrect Alive Rolling Count and Checksum Error [CAN Bus C $0C3] [DTC U18A7] n) Timer - Diagnostic Enable	 m2) == TRUE m3) == False n) > 2.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Pump Performance - Over Pressure	P3188	This DTC detects degradation in the performance of the electronically regulated fuel system by calculating the difference between the sensed, filtered system [line] pressure versus the ECM-commanded pressure [error calculation]. The calculated error is then compared to calibrated fault threshold tables for a fault decision.	Sensed Filtered Fuel System [line] pressure error	<= Threshold [Supporting Table] **P3188_Threshold**	a) Diagnostic is ..	a) Enabled	1 sample/ 12.5 millisec	Type B, 2 Trips
					b1) CAN Sensor Bus Fuel Pmp Spd Command ARC and Checksum Comm Fault Code [Cmd1 DTC U131D]	b1)== False		
					b2) Sensor Configuration	b2) == CeFDBR_e_WiredTo_FTZM		
					b3) Fuel Pres Sensor Serial Comm Ready	b3) == TRUE		
					b4) Fuel Pres Sensor Serial Comm Fault Pending [DTC P14D5]	b4) == False		
					b5) Sensed Fuel Control Enable Serial Comm Ready	b5) == TRUE		
					b6) Sensed Fuel Control Enable Serial Comm Fault Pending	b6) == False		
					c1) Fuel Flow data Valid	c1)== TRUE		
					c2) Ambient Air Pressure Value Defaulted	c2) == False		
					c3) Fuel Pres Sensor Type	c3) == CeFDBR_e_AbsolutePressure		
					c4) Fault Bundle FDB_FuelPresSnsrCktFA	c4) == False		
					c5) Reference Voltage	c5) == False		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Fault Status [DTC P0641]			
					c6) Fuel Pres Sensor Performance Fault Active [DTC P018B]	c6) == False		
					c7) Use Calculated Flow Performance Fault Thresholds	c7) == False		
					c8) Engine Speed Status Valid	c8] ==TRUE		
					c9) Fault bundle FAB_FuelPmpCktFA	c9] == False		
					c10) Fuel Pump Driver Module OverTemp Fault Active [DTC P1255]	c10) == False		
					c11) Fuel Pump Speed Fault Active [DTCP129F]	d 1) == False		
					c12) Fuel Pump Duty Cycle Fault Active [DTC P2BB3]	c12) == False		
					c13) CAN Sensor Bus message $0C3 Comm Fault [DTCP165C]	c13) ––False		
					c14) Fuel Pres Sensor Serial Comm Fault Active [DTC P14D5]	c14) == False		
					c15) Sensor Bus Relay On	c15) == TRUE		
					d1) Timer -- Minimum Engine Running	d1)>= 30.00 seconds		
					d2) Diaanostic Data	d2) == TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Integrity OK e) Fuel Control Enable f) Fuel Pump Control State g) Instantaneous Fuel Flow h) Fuel Control Enable Fault Active [DTC P12A6] j) Emissions Fuel Level Low [Message $3FB] k) High Pres Fuel Pump Mode Management Enabled l) High Pres Fuel Pump Control Mode m) Diagnostic Data OK n) Timer - Diagnostic Enable	 e) == TRUE f) == Normal AND == NOT Over Response Active g) >= 0.05 gms /sec h) == False j) == False k) == False l) == NOT Disabled Mode AND NOT Over Response Active Mode m) == TRUE n) > 2.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Propulsion System Performance	P31C2	This diagnostic indicates that the engine has stalled and the retry strategy has not been succesful in re-starting the engine.	While the engine is running, an engine stall event occurs. If the stall remediation actions are not successful in keeping the engine running and the engine retry strategy is not available or is not successful in restarting the engine. Note: When attempting to restart the engine, only 1 start retry is allowed per available actuator for each stall event. The number of total retries (all available actuators) is calibratible and limited each key cycle to 255.00 retry attempt(s).	Engine Stall Detected = TRUE	P31C3 Low Fuel Condition Low Fuel Condition Fault Engine Position Fault (Cam or Crank) Propulsion Allowed MEC Counter Condition valid for all applications except Strong Hybrid: Vehicle Speed is higher than for a time longer than Condition valid for Strong Hybrid applications only: Propulsion System is active for a time longer than	= NOT Fault Active =FALSE (% Total Fuel Level < 10.00% for > 30.00 sec) = FALSE = FALSE = TRUE = 0 = 10.00 = 0.50 = KePSAR_t_PropSysActvTmr	Fail condition met for 12.5 ms (1 sample)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			The engine is running.	Engine Start Stop State = ENGINE RUNNING	Engine Start Stop State Previous	!= ENGINE RUNNING	Pass condition met for 12.5 ms (1 sample)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication Bus A Off	U0073	This DTC monitors for a BUS A off condition	Bus off failures equals or exceeds	>= 10.00 counts in a sliding window of 50 samples	General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type A, 1 Trips
					Starter motor engaged for	> 15,000.00 milliseconds		
					Or			
					Run/Crank ignition voltage	>8.41 Volts		
					All below criteria have been met for	>= 5,000.00 milliseconds		
					CAN channel is requesting full communications			
					Normal CAN transmission on Bus is enabled			
					Accessory mode to off mode not pending	>11.00 Volts		
					Battery voltage			
					Conroller is an OBD controller	<=18.00 Volts		
					Or			
					Battery Voltage			
					Controller type: OBD Controller			
					If power mode = Run/ Crank:	>=11.00 Volts		
					Run/Crank ignition voltage			
					If power mode = Accessory:	Disabled		
					Off key cycle diagnostics are enabled			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication Bus B Off	U0074	This DTC monitors for a BUS B off condition	Bus off failures equals or exceeds	>= 10.00 counts in a sliding window of 50 samples	General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
					Starter motor engaged for	> 15,000.00 milliseconds		
					Or			
					Run/Crank ignition voltage	>8.41 Volts		
					All below criteria have been met for	>= 5,000.00 milliseconds		
					CAN channel is requesting full communications			
					Normal CAN transmission on Bus is enabled			
					Accessory mode to off mode not pending	>11.00 Volts		
					Battery voltage			
					Conroller is an OBD controller	<=18.00 Volts		
					Or			
					Battery Voltage			
					Controller type: OBD Controller			
					If power mode = Run/ Crank:	>=11.00 Volts		
					Run/Crank ignition voltage			
					If power mode = Accessory:	Disabled		
					Off key cycle diagnostics are enabled			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication Powertrain Sensor CAN Bus Off	U0076	This DTC monitors for a Powertrain Sensor Bus S off condition	Bus off failures equals or exceeds	>= 10.00 counts in a sliding window of 50 samples	General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type A, 1 Trips
					Starter motor engaged for	> 15,000.00 milliseconds		
					Or Run/Crank ignition voltage	>8.41 Volts		
					All below criteria have been met for	>= 5,000.00 milliseconds		
					CAN channel is requesting full communications			
					Normal CAN transmission on Bus is enabled			
					Accessory mode to off mode not pending	>11.00 Volts		
					Battery voltage			
					Conroller is an OBD controller Or Battery Voltage	<=18.00 Volts		
					Controller type: OBD Controller			
					If power mode = Run/ Crank:	>=11.00 Volts		
					Run/Crank ignition voltage			
					If power mode = Accessory:	Disabled		
					Off key cycle diagnostics are enabled			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Engine Coolant Bypass Valve E (HEAT - ORV)	U00A1	Communication Check This DTC will detect if SENT communication was lost for the Engine Coolant Bypass Valve E Sensor.	If any of the following conditions are met a failure count will be recorded: **Condition 1:** HWIO message faults **Condition 2:** Pulse count delta AND Message age **Condition 3:** Voltage on SENT pin is greater than a controller specific threshold AND Message age **Condition 4:** Voltage on SENT pin is less than a controller specific threshold AND Message age	 = No Fault >0 >6.25 ms >6.25 ms >6.25 ms	Diagnostic is Enabled Run Crank Ignition in Range Engine not cranking Engine Diag System	 = True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Gear Shift Control Module "A"	U0103	This DTC monitors for a loss of communication on the LIN bus 2 with Gear Shift Control Module "A".	Message is not received from controller for ESMRsp	>= 500.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD	 Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts Disabled	LIN bus communication executes in 500ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Generator Primary	U012D	This DTC monitors for a loss of communication on LIN bus 3 with the generator.	Message is not received from controller for LGEN_RSP	>= 125.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller	Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts Disabled	LIN bus communication executes in 500ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Power Steering Control Module	U0131	This DTC monitors for a loss of communication with the Power Steering Control Module.	Message is not received from controller for Message $054:	>10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	>= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 >=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Body Control Module	U0140	This DTC monitors for a loss of communication with the Body Control Module.	Message is not received from controller for Message $03E: Message $248: Message $27A: Message $2C1: Message $2D8: Message $2D9: Message $36C: Message $36E: Message $3A4: Message $479: Message $4E9: Message $512: Message $524:	>425.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >325.00 milliseconds >325.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	>= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Message $580: Message $581: Message $583: Message $592: Message $5A2: Message $5B8: Message $5C6: Message $5E2: Message $711:	>10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds	If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				>10,000.00 milliseconds				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Restraints Control Module	U0151	This DTC monitors for a loss of communication with the Restraints Control Module.	Message is not received from controller for Message $039: Message $0B9: Message $528: Message $52A:	 >10,000.00 milliseconds >10,000.00 milliseconds >450.00 milliseconds >450.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	 >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Active Grill Air Shutter Module A	U0284	This DTC monitors for a loss of communication on the LIN bus 1 with Shutter Module A.	Message is not received from controller for ACM1_Rsp	 >=1,250.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Actuator relay is powered Or Powertrain Relay is on and powertrain relay state feedback is enabled All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage	 Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts	LIN bus communication executes in 500ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Active Grill Air Shutter Module B	U0285	This DTC monitors for a loss of communication on the LIN bus with Shutter Module B.	Message is not received from device for ACM2_Rsp	>=1,250.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Actuator relay is powered Or Powertrain Relay is on and powertrain relay state feedback is enabled All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage	 Enabled Enabled Disabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts	LIN bus communication executes in 500ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Loss of Communication with Charge Air Cooler Electric Water Pump	U02A9	This DTC monitors for a loss of communication on the LIN bus with the Charge Air Cooler Electric Water Pump.	Message is not received from device for CWP_Rsp	>=2,500.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Actuator relay is powered Or Powertrain Relay is on and powertrain relay state feedback is enabled All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage	 Enabled Enabled Disabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts	LIN bus communication executes in 500ms loop.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with EVAP Purge Pump	U02BB	This DTC monitors for a loss of communication on the LIN bus with the EVAP Purge Pump	Message is not received from controller for EVAPP_Rsp_01_C05	>= 250.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Actuator relay is powered Or Powertrain Relay is on and powertrain relay state feedback is enabled All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Run/Crank ignition voltage If power mode = Accessory:	 Enabled Enabled Disabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts Disabled	LIN bus communication executes in 500ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Gear Shift Control Module A	U0404	This DTC monitors for an error in communication with the Gear Shift Control Module A.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for:		Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus.		Executes in 12.5ms loop.	Type B, 2 Trips
			LS1ISP_ARC:	4.00 fail counts out of 10.00 sample counts	All the following conditions are met for:	>= 5,000.00 milliseconds		
			LnrSnsrlInSec_Prtctd:	4.00 fail counts out of 10.00 sample counts	Battery voltage	>= 11.00 volts		
			DISSP.ARC:	4.00 fail counts out of 10.00 sample counts	Accessory mode to off mode transition not pending			
			DscrlnSnsrSec_Prtctd:	4.00 fail counts out of 10.00 sample counts	If controller is a non-OBD controller then battery voltage	<= 18.00 volts		
			DISP_ARC:	8.00 fail counts out of 18.00 sample counts	Controller type: OBD Controller			
			DISP_CS:	8.00 fail counts out of 18.00 sample counts				
			LSIP_ARC:	8.00 fail counts out of 18.00 sample counts				
			LSIP_CS:	8.00 fail counts out of 18.00 sample counts				
			EALUCSP.ARC:	4.00 fail counts out of				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				10.00 sample counts				
			ExtrnALUChkSec_Prtctd:	4.00 fail counts out of 10.00 sample counts				
			LS2I8P_ARC:	4.00 fail counts out of 10.00 sample counts				
			LnrSnsr2lnSec_Prtctd:	4.00 fail counts out of 10.00 sample counts				
			ESM-ARC:	8.00 fail counts out of 10.00 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Four-Wheel Drive Clutch Control Module	U0414	This DTC monitors for an error in communication with the Four-Wheel Drive Clutch Control Module.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: SAP_ARC: SecAxl_Prtctd:	 8.00 fail counts out of 18.00 sample counts 8.00 fail counts out of 18.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	 >= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Brake System Control Module	U0418	This DTC monitors for an error in communication with the Brake System Control Module.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for:		Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus.		Executes in 12.5ms loop.	Type A, 1 Trips
			SD16P_ARC:	8.00 fail counts out of 18.00 sample counts	All the following conditions are met for:	>= 5,000.00 milliseconds		
					Battery voltage	>= 11.00 volts		
			SrlDat16_Prtctd:	8.00 fail counts out of 18.00 sample counts	Accessory mode to off mode transition not pending			
			RATVCP.ARC:	8.00 fail counts out of 18.00 sample counts	If controller is a non-OBD controller then battery voltage	<= 18.00 volts		
			RrAxTrqValCmd_Prtctd:	8.00 fail counts out of 18.00 sample counts	Controller type: OBD Controller			
			BSIS2P_ARC:	8.00 fail counts out of 18.00 sample counts				
			BrkSyslnfoSts2_Prtctd:	8.00 fail counts out of 18.00 sample counts				
			SWIP_ARC:	8.00 fail counts out of 18.00 sample counts				
			StrgWhllnfo_Prtctd:	8.00 fail counts out of 18.00 sample counts				
			WRDSP_ARC:	3.00 fail counts out of				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				10.00 sample counts				
			EBCMGnrlInfo2_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			SD15P_ARC:	3.00 fail counts out of 10.00 sample counts				
			SrlDat15_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			BSIR3P_ARC:	3.00 fail counts out of 10.00 sample counts				
			BrkSyslnfoReqs3_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			SD14P_ARC:	3.00 fail counts out of 10.00 sample counts				
			SrlDat14_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			8ATCRTP_ARC:	3.00 fail counts out of 10.00 sample counts				
			SecAxlTrqCplRqTy_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			SD17P_ARC:	3.00 fail counts out of 10.00 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			SrlDat17_Prtctd:	3.00 fail counts out of 10.00 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Power Steering Control Module	U0420	This DTC monitors for an error in communication with the Power Steering Control Module.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: SWIP_ARC: StrgWhllnfo_Prtctd:	 8.00 fail counts out of 18.00 sample counts 8.00 fail counts out of 18.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	 >= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Body Control Module	U0422	This DTC monitors for an error in communication with the Body Control Module.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for:		Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus.		Executes in 12.5ms loop.	Type B, 2 Trips
			BGI3P_ARC:	8.00 fail counts out of 18.00 sample counts	All the following conditions are met for:	>= 5,000.00 milliseconds		
					Battery voltage	>= 11.00 volts		
			BdyGenInfo3_Prtctd:	8.00 fail counts out of 18.00 sample counts	Accessory mode to off mode transition not pending			
			SD187P_ARC:	3.00 fail counts out of 10.00 sample counts	If controller is a non-OBD controller then battery voltage	<= 18.00 volts		
			SrlDat187_Prtctd:	3.00 fail counts out of 10.00 sample counts	Controller type: OBD Controller			
			SD2P_ARC:	3.00 fail counts out of 10.00 sample counts				
			SrlDat2_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			SD9_ARC:	3.00 fail counts out of 10.00 sample counts				
			SD9_CS:	3.00 fail counts out of 10.00 sample counts				
			SD3_ARC:	3.00 fail counts out of				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				10.00 sample counts				
			SrlDat3_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			SPMP_ARC:	3.00 fail counts out of 10.00 sample counts				
			SysPwrMode_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			PltfTrnsTUDSwStARC:	3.00 fail counts out of 10.00 sample counts				
			SD118_ARC:	8.00 fail counts out of 10.00 sample counts				
			IBSBatVlt_ARC:	3.00 fail counts out of 10.00 sample counts				
			IBSBatVlt_CS:	3.00 fail counts out of 10.00 sample counts				
			SD145_ARC:	3.00 fail counts out of 10.00 sample counts				
			SD145_CS:	3.00 fail counts out of 10.00 sample counts				
			VehOdoDispVal_Prtctd:	3.00 fail counts out of 10.00 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			SD8_ARC:	3.00 fail counts out of 10.00 sample counts				
			SD8_CS:	3.00 fail counts out of 10.00 sample counts				
			CCHI_ARC:	3.00 fail counts out of 10.00 sample counts				
			CCHI_CS:	3.00 fail counts out of 10.00 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Gateway A	U0447	This DTC monitors for an error in communication with the Gateway A.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: BSPMP_ARC: BkupSysPwrMode_Prtctd: SrlDat90_Prtctd:	 3.00 fail counts out of 10.00 sample counts 3.00 fail counts out of 10.00 sample counts 3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	 >= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Restraints Control Module	U0452	This DTC monitors for an error in communication with the Restraints Control Module.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for:		Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus.		Executes in 12.5ms loop.	Type C, 1 Trip No MIL Emissions Neutral
			SD46P_ARC:	8.00 fail counts out of 18.00 sample counts	All the following conditions are met for:	>= 5,000.00 milliseconds		
					Battery voltage	>= 11.00 volts		
			SrlDat46_Prtctd:	8.00 fail counts out of 18.00 sample counts	Accessory mode to off mode transition not pending			
			SD47P_ARC:	4.00 fail counts out of 10.00 sample counts	If controller is a non-OBD controller then battery voltage	<= 18.00 volts		
			SrlDat47_Prtctd:	4.00 fail counts out of 10.00 sample counts	Controller type: OBD Controller			
			PCIP_ARC:	3.00 fail counts out of 10.00 sample counts				
			PstClsnInfo_Prtctd:	3.00 fail counts out of 10.00 sample counts				
			ORIP-ARC:	3.00 fail counts out of 10.00 sample counts				
			OccptRstrntInfo_Prtctd:	3.00 fail counts out of 10.00 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Active Grill Air Shutter Module A	U0585	This DTC monitors for an error in communication with the Active Grill Air Shutter Module A.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: ACMIJnitStatARC:	3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	>= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Active Grill Air Shutter Module B	U0586	This DTC monitors for an error in communication with the Active Grill Air Shutter Module B.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: ACM2_InitStatARC:	3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	>= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From DC/DC Converter Control Module A	U0599	This DTC monitors for an error in communication with the DC/DC Converter Control Module A.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: DCCnvActrVltADCValARC: DCCCnvCrnkCtlTrmStARC: DCCnvActrVltADCValPVal: DCCCnvCrnkCtlTrmStPVal:	8.00 fail counts out of 18.00 sample counts 8.00 fail counts out of 18.00 sample counts 8.00 fail counts out of 18.00 sample counts 8.00 fail counts out of 18.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	>= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Charge Air Cooler Water Pump Motor	U05AA	This DTC monitors for an error in communication with the Charge Air Cooler Water Pump Motor.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: CACPmpARC:	3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	>= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Throttle Position Sensor 1	U0606	Detects a continuous or intermittent short low or short high or open fault in the TPS SENT Communication Circuit 1 by monitoring the voltage and failing the diagnostic when the voltage for the wave pulse is below or above state threshold as defined by SAE J2716 SENT Protocol. Detects a message fault in the TPS SENT Communication Circuit by monitoring the message pulse time and failing the diagnostic when the time for the pulse is below a low time threshold or above a high time threshold or if the message age limit is greater than a time threshold. This diagnostic only runs when battery voltage is high enough.	Voltage for wave pulse is below state threshold as defined by SAE J2716 SENT Protocol OR Voltage for wave pulse is above state threshold as defined by SAE J2716 SENT Protocol OR Message Pulse < Message Pulse > OR Message Age Limit >= OR Signal CRC fails	0.5 V OR 4.1 V OR 0.125977 ms 0.209991 ms OR 3.125 ms	Run/Crank voltage	> 6.41 Volts	79/159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Throttle Position Sensor 2	U0607	Detects a continuous or intermittent short low or short high or open fault in the TPS SENT Communication Circuit 2 by monitoring the voltage and failing the diagnostic when the voltage for the wave pulse is below or above state threshold as defined by SAE J2716 SENT Protocol. Detects a message fault in the TPS SENT Communication Circuit by monitoring the message pulse time and failing the diagnostic when the time for the pulse is below a low time threshold or above a high time threshold or if the message age limit is greater than a time threshold. This diagnostic only runs when battery voltage is high enough.	Voltage for wave pulse is below state threshold as defined by SAE J2716 SENT Protocol OR Voltage for wave pulse is above state threshold as defined by SAE J2716 SENT Protocol OR Message Pulse < Message Pulse > OR Message Age Limit >= OR Signal CRC fails	0.5 V OR 4.1 V OR 0.125977 ms 0.209991 ms OR 3.125 ms	Run/Crank voltage	> 6.41 Volts	79/159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Mass or Volume Air Flow Sensor A	U060F	This DTC monitors for a loss of communication on the LIN bus 2 with Mass or Volume Air Flow Sensor A.	Message is not received from controller for MAF1_Press_Rsp MAF1_TmpHum_Rsp	 >=62.50 milliseconds >= 250.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or	 Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts Disabled	LIN bus communication executes in 500ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Engine Coolant Bypass Valve C (HEAT - RRV)	U0617	Communication Check This DTC will detect if SENT communication was lost for the Engine Coolant Bypass Valve C Sensor	If any of the following conditions are met a failure count will be recorded: **Condition 1:** HWIO message faults **Condition 2:** Pulse count delta AND Message age **Condition 3:** Voltage on SENT pin is greater than a controller specific threshold AND Message age **Condition 4:** Voltage on SENT pin is less than a controller specific threshold AND Message age	 = No Fault >0 >6.25 ms >6.25 ms >6.25 ms	Diagnostic is Enabled Run Crank Ignition in Range Engine not cranking Engine Diag System	 = True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Engine Coolant Bypass Valve D (HEAT - BRV)	U0618	Communication Check This DTC will detect if SENT communication was lost for the Engine Coolant Bypass Valve D Sensor.	If any of the following conditions are met a failure count will be recorded: **Condition 1:** HWIO message faults **Condition 2:** Pulse count delta AND Message age **Condition 3:** Voltage on SENT pin is greater than a controller specific threshold AND Message age **Condition 4:** Voltage on SENT pin is less than a controller specific threshold AND Message age	= No Fault >0 >6.25 ms >6.25 ms >6.25 ms	Diagnostic is Enabled Run Crank Ignition in Range Engine not cranking Engine Diag System	= True = True = Enabled	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Fuel Rail Pressure Sensor Bank 1	U0625	This DTC determines if the SENT signal shorted low, this is determined by monitoring the number pulses on the SENT signal line received at the ECU and the SENT Signal Line State always indicating low.	The number pulses on the SENT signal line SENT Signal Line State	<= 40 = Low	SENT Sensor Communication Circuit Diagnostic Enabled SENT power up delay	True >= 0.00 seconds Enabled when a code clear is not active or not exiting device control	400 failures out of 500 samples 6.25 ms per sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Cooling Fan 1 LIN Communication Failure	U0632	This DTC monitors for a loss of communication on the LIN bus 1 with Cooling Fan 1.	Message is not received from controller for CFM1_RSP	>=2,500.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Engine is running Or Engine cooling fan operation is enabled via received CAN signal and propulsion system is active for All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage	Enabled Enabled >=1.00 milliseconds >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts	LIN bus communication executes in 500ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Loss of communication with wastegate position sensor “A”	U0644	Detects a continuous communication fault on the eWG "A" SENT interface. The diagnostic monitors the SENT message in respect to message pulses and timing validity. In series applications, turbocharger 'A' is the first turbocharger in the direction of exhaust flow. In parallel applications, turbocharger 'A' is associated with engine bank 1.	SENT Mesage Faults SENT Mesage age	> 0 ent >3.13 ms	Diagnostic enabled and Sent Interface used ********** Powertrain relay voltage ********** Engine does not crank Diagnostic system not disabled	True True ********** >=11.0 Volts **********	10 failures out of 12 samples 100ms /sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Fuel Temperature SensorA	U0670	This DTC determines if the SENT signal shorted low, this is determined by monitoring the number pulses on the SENT signal line received at the ECU and the SENT Signal Line State always indicating high.	The number pulses on the SENT signal line SENT Signal Line State	<= 40 = High	SENT Sensor Communication Circuit Diagnostic Enabled SENT power up delay	True >= 0.00 seconds Enabled when a code clear is not active or not exiting device control	400 failures out of 500 samples 6.25 ms per sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Fuel Temperature Sensor B	U0671	This DTC determines if the SENT signal shorted low, this is determined by monitoring the number pulses on the SENT signal line received at the ECU and the SENT Signal Line State always indicating high.	The number pulses on the SENT signal line SENT Signal Line State	<= 40 = High	SENT Sensor Communication Circuit Diagnostic Enabled SENT power up delay	True >= 0.00 seconds Enabled when a code clear is not active or not exiting device control	400 failures out of 500 samples 6.25 ms per sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Engine Coolant Pump	U0672	This DTC monitors for a loss of communication on the LIN bus with the Engine Coolant Pump	Message is not received from controller for MWP_Rsp_0F_C05	>= 250.00 milliseconds	General Enable Criteria: Diagnostic is enabled LIN channel is enabled LIN module is initialized Slave is calibrated as present Actuator relay is powered Or Powertrain Relay is on and powertrain relay state feedback is enabled All below criteria have been met for Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage If power mode =	Enabled Disabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts	LIN bus communication executes in 500ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Fuel Tank Zone Module Configuratio n Error	U101A	FTZM Pump Control Configuration Management provides a method for a Diagnostic and Emissions-Critical Electronic Control Unit (DEC ECU) to communicate configuration information to an OBD Smart Device (SD); in this case the FTZM. The FTZM contains pre-loaded sets of calibrations, each of which specifies proper tuning values for electronic commutation of corresponding fuel pump motor variants including a default value that denotes a non-operational [factory default] pump variant. This configuration management feature provides a method to reduce the number of FTZM end-item part numbers. The Configuration Error Diagnostic runs every 100ms to verify that a calibration index value is present that is not the factory default value. When the diagnostic identifies that the default index value is loaded, the	FTZM Fuel Pump Configuration Calibration Index Value	= Factory Default Index Value OR = Not Configured Index Value [device failed to accept calibration value on 1st wake-up]	a] Diagnostic is .. b] Device feedback Faulted; c] Diagnostic system disabled; d] CAN serial data message $3C8 received	a] Enabled b] <> True; c] <>True; d] =TRUE	6 failures of 8 samples 100 msec / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		DTC is set.						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Fuel Rail Pressure Sensor Bankl Sensor 2	U101B	This DTC determines if the SENT signal shorted low, this is determined by monitoring the number pulses on the SENT signal line received at the ECU and the SENT Signal Line State always indicating high.	The number pulses on the SENT signal line SENT Signal Line State	<= 40 = High	SENT Sensor Communication Circuit Diagnostic Enabled SENT power up delay	True >= 0.00 seconds Enabled when a code clear is not active or not exiting device control	400 failures out of 500 samples 6.25 ms per sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with ETRS Position Sensor 1	U1191	Detects Circuit Error	Rolling Pulse Count stops (same value across two software loops) Current RPC	= the last RPC value	Diagnostic Enable Calibration	1.00	160.00 failures out of 200.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with ETRS Position Sensor 2	U1194	Detects Circuit Error	Rolling Pulse Count stops (same value across two software loops) Current RPC	= the last RPC value	Diagnostic Enable Calibration	1.00	160.00 failures out of 200.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with ETRS Park Switch 1	U1195	Detects Circuit Error	Rolling Pulse Count stops (same value across two software loops) Current RPC	 = the last RPC value	Diagnostic Enable Calibration	1.00	160.00 failures out of 200.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with ETRS Park Switch 2	U1196	Detects Circuit Error	Rolling Pulse Count stops (same value across two software loops) Current RPC	 = the last RPC value	Diagnostic Enable Calibration	=TRUE 1.00	160.00 failures out of 200.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Intake/Single Camshaft Position Actuator	U11E2	This DTC monitors for a loss of communication with the Intake/Single Camshaft Position Actuator	Message is not received from controller for Message $1FF Message $5EB	 >=10,000.00 milliseconds >=10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	 >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	 Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Cooling Fan Motor 1	U1314	This DTC monitors for an error in communication with the Cooling Fan Motor 1.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: PrplCoolFn1_ARC:	3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	>= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Mass Air Flow Sensor 1	U1319	This DTC monitors for an error in communication with the Mass Air Flow Sensor 1.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: PAMITempHmdtyARC: PAMIPresARC:	 3.00 fail counts out of 10.00 sample counts 8.00 fail counts out of 18.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	 >= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Main Water Pump Motor	U131B	This DTC monitors for an error in communication with the Main Water Pump Motor.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: MainCoolPmpARC:	3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	>= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Fuel Tank Zone Module	U131D	This DTC monitors for an error in communication with the Fuel Tank Zone Module.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for:		Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus.		Executes in 12.5ms loop.	Type A, 1 Trips
			FTZMInfolARC:	8.00 fail counts out of 18.00 sample counts	All the following conditions are met for:	>= 5,000.00 milliseconds		
					Battery voltage	>= 11.00 volts		
			FTZMInfolChksm:	8.00 fail counts out of 18.00 sample counts	Accessory mode to off mode transition not pending			
			FTZMInfo11ARC:	8.00 fail counts out of 18.00 sample counts	If controller is a non-OBD controller then battery voltage	<= 18.00 volts		
			FTZMInfo11Chksm:	8.00 fail counts out of 18.00 sample counts	Controller type: OBD Controller			
			FTZMInfo8ARC:	8.00 fail counts out of 18.00 sample counts				
			FTZMInfo8Chksm:	8.00 fail counts out of 18.00 sample counts				
			FTZMInfo2ARC:	8.00 fail counts out of 18.00 sample counts				
			FTZMInfo2Chksm:	8.00 fail counts out of 18.00 sample counts				
			FTZMInfo12ARC:	8.00 fail counts out of				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				18.00 sample counts				
			FTZMInfo12Chksm:	8.00 fail counts out of 18.00 sample counts				
			FTZMInfo14ARC:	8.00 fail counts out of 18.00 sample counts				
			FTZMInfo14Chksm:	8.00 fail counts out of 18.00 sample counts				
			FTZMInfo3ARC:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo3Chksm:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo4ARC:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo4Chksm:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo5ARC:	4.00 fail counts out of 10.00 sample counts				
			FTZMInfo5Chksm:	4.00 fail counts out of 10.00 sample counts				
			FTZMInfo16ARC:	3.00 fail counts out of 10.00 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			FTZMInfo16Chksm:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo6ARC:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo6Chksm:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo7ARC:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo7Chksm:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo9ARC:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo9Chksm:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo13ARC:	3.00 fail counts out of 10.00 sample counts				
			FTZMInfo13Chksm:	3.00 fail counts out of 10.00 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Block Coolant Valve Actuator	U1379	This DTC monitors for an error in communication with the Block Coolant Valve Actuator.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: BRV_ARC:	3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	>= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from EVAP Purge Pump	U137A	This DTC monitors for an error in communication with the EVAP Purge Pump.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: EVAPPurgPmpARC:	3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	>= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data from ETRS Position Sensor 1	U13E0	Detects Message Error	Message Faults detected OR Message Age too old	>=185.00	Not Fault Active (no Lost Comm FP) Diagnostic Enable Calibration	U1191, U1195 1.00	100.00 failures out of 120.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data from ETRS Position Sensor 2	U13E1	Detects Message Error	Message Faults detected OR Message Age too old	>= 185.00 >=185.00	Not Fault Active Diagnostic Enable Calibration	U1194, U1196 1.00	100.00 failures out of 120.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data from ETRS Park Switch 1	U13E2	Detects Message Error	Message Faults detected OR Message Age too old	>=185.00	Not Fault Active Diagnostic Enable Calibration	U1191, U1195 1.00	100.00 failures out of 120.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data from ETRS Park Switch 2	U13E3	Detects Message Error	Message Faults detected or Message Age too old	>= 185.00	Not Fault Active Diagnostic Enable Calibration	U1194, U1196 1.00	100.00 failures out of 120.00 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
E-Phaser CAN Communication	U13FF	The PCM monitors the CAN Communications Signal fault status provided by the Smart Device. If signal indicates a fault then both sample and fail counters will be incremented otherwise only the sample counter will be incremented. If fail counter is greater than or equal to the failure threshold before sample counter reaches sample threshold then report failure.	The PCM monitors the CAN Communications Signal fault status provided by the Smart Device. If signal indicates a fault then both sample and fail counters will be incremented otherwise only the sample counter will be incremented. If fail counter is greater than or equal to the failure threshold before sample counter reaches sample threshold then report failure.	Fault responses equal or exceed fail threshold in a given number of samples.	Ephaser Application System Voltage in range Diagnostic Enable	= Enabled >=11.00V = Enabled	150.00 failures out of 200.00 samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Intake/ Single Camshaft Position Actuator	U1403	This DTC monitors for an error in communication with the Intake/Single Camshaft Position Actuator.	The signal value of the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) of the following signals received over serial data is incorrect for: ECPS1_ARC: ECPS1_CS: ECPS2_ARC: ECPS2_CS:	 8.00 fail counts out of 18.00 sample counts 8.00 fail counts out of 18.00 sample counts 3.00 fail counts out of 10.00 sample counts 3.00 fail counts out of 10.00 sample counts	Message frame containing the Alive Rolling Count (ARC),Protection Value (PV), or Checksum (CSUM) is available on the bus. All the following conditions are met for: Battery voltage Accessory mode to off mode transition not pending If controller is a non-OBD controller then battery voltage Controller type: OBD Controller	 >= 5,000.00 milliseconds >= 11.00 volts <= 18.00 volts	Executes in 12.5ms loop.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Control Module Local Interconnect Network 1	U154B	This DTC monitors for a LIN bus off condition on LIN Bus 1.	Loss of Communication Method: The total number of diagnostic enabled slave nodes on LIN Bus 1 Or LIN channel Wakeup Method: LIN channel wakeup repetition counter	 = Total number of slave nodes on LIN Bus 1 that have reported lost communications DTCs >= 10.00 counts	Loss of Communication Method: Diagnostic is enabled LIN channel is enabled LIN module is initialized All below criteria have been met for: LIN channel is requesting full communications Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics	 Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts Disabled	Dependent on bus loading.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage LIN channel Wakeup Method: Diagnostic is enabled LIN channel is enabled LIN channel is requesting full communications LIN module is initialized The following criteria have been enabled for: Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage	>=11.00 Volts Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Control Module Local Interconnect Network 2	U154C	This DTC monitors for a LIN bus off condition on LIN Bus 2.	Loss of Communication Method:		Loss of Communication Method:		Dependent on bus loading.	Type A, 1 Trips
			The total number of diagnostic enabled slave nodes on LIN Bus 2	= Total number of slave nodes on LIN Bus 2 that have reported lost communications DTCs	Diagnostic is enabled	Enabled		
					LIN channel is enabled	Enabled		
					LIN module is initialized			
			Or		All below criteria have been met for	>= 5,000.00 milliseconds		
			LIN channel Wakeup Method:		LIN channel is requesting full communications			
					Accessory mode to off mode not pending			
			LIN channel wakeup repetition counter	>= 10.00 counts	Battery voltage	>11.00 Volts		
					Conroller is an OBD controller Or Battery Voltage	<=18.00 Volts		
					Controller type: OBD Controller			
					If power mode = Run/ Crank:			
					Power Mode is run			
					Run/Crank ignition voltage	>=11.00 Volts		
					If power mode = Accessory:			
					Off key cycle diagnostics are enabled	Disabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage LIN channel Wakeup Method: Diagnostic is enabled LIN channel is enabled LIN channel is requesting full communications LIN module is initialized The following criteria have been enabled for: Accessory mode to off mode not pending Battery voltage	>=11.00 Volts Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Control Module Local Interconnect Network 3	U154D	This DTC monitors for a LIN bus 3 off condition.	Loss of Communication Method: The total number of diagnostic enabled slave nodes on LIN Bus 3 Or LIN channel Wakeup Method: LIN channel wakeup repetition counter	 = Total number of slave nodes on LIN Bus 3 that have reported lost communications DTCs >= 10.00 counts	Loss of Communication Method: Diagnostic is enabled LIN channel is enabled LIN module is initialized The following criteria have been enabled for: LIN channel is requesting full communications Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage If power mode = Accessory Off key cycle diagnostics are enabled	 Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts Disabled	Dependent on bus loading.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Or Controller is an OBD controller Controller shutdown not impending Power Mode is not run/ crank Battery voltage LIN channel Wakeup Method: Diagnostic is enabled LIN channel is enabled LIN channel is requesting full communications LIN module is initialized The following criteria have been enabled for: Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage	>=11.00 Volts Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Control Module Local Interconnect Network 4	U154E	This DTC monitors for a LIN bus 4 off condition.	Loss of Communication Method: The total number of diagnostic enabled slave nodes on LIN Bus 4 Or LIN channel Wakeup Method: LIN channel wakeup repetition counter	 = Total number of slave nodes on LIN Bus 4 that have reported lost communications DTCs >= 10.00 counts	Loss of Communication Method: Diagnostic is enabled LIN channel is enabled LIN module is initialized The following criteria have been enabled for: LIN channel is requesting full communications Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run Run/Crank ignition voltage Off key cycle diagnostics are enabled Or Controller is an OBD controller	 Enabled Enabled >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts >=11.00 Volts Disabled	Dependent on bus loading.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller shutdown not impending			
					Power Mode is not run/ crank			
					Battery voltage	>=11.00 Volts		
					LIN channel Wakeup Method:			
					Diagnostic is enabled	Enabled		
					LIN channel is enabled	Enabled		
					LIN channel is requesting full communications			
					LIN module is initialized			
					The following criteria have been enabled for:	>= 5,000.00 milliseconds		
					Accessory mode to off mode not pending			
					Battery voltage	>11.00 Volts		
					Conroller is an OBD controller Or Battery Voltage	<=18.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Gateway A on CAN 2	U1608	This DTC monitors for a loss of communication with the Gateway A on CAN 2.	Message is not received from controller for Message $2C3: Message $370: Message $3A2: Message $3B0: Message $3BC: Message $3BF: Message $3C2: Message $3C3: Message $3C4: Message $4DC: Message $500: Message $57F: Message $590:	>10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	>= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Message $5A1: Message $5AA: Message $5F9:	>10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds	If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Central Gateway Module on CAN Bus 3	U1609	This DTC monitors for a loss of communication with the Central Gateway Module on CAN Bus 3.	Message is not received from controller for Message $3C2: Message $58C:	 >10,000.00 milliseconds >10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	 >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Brake System Control Module 1 on CAN Bus 2	U1610	This DTC monitors for a loss of communication with the Brake System Control Module 1 on CAN Bus 2.	Message is not received from controller for Message $03B: Message $042: Message $270: Message $27B: Message $369: Message $36A: Message $3AA: Message $3AB: Message $4EB: Message $4F1: Message $51C: Message $586: Message $5C9:	>425.00 milliseconds >10,000.00 milliseconds >200.00 milliseconds >10,000.00 milliseconds >325.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	>= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Message $5CA: Message $5CB: Message $5CC: Message $5CD:	>10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds	If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Electronic Brake Control Module on CAN Bus 3	U1639	This DTC monitors for a loss of communication with the Electronic Brake Control Module on CAN Bus 3.	Message is not received from controller for Message $362:	>325.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	>= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with External Object Calculating Module/ EOCM_HCP1/EOCM3/ ACP2_MCU on CAN Bus 3	U163D	This DTC monitors for a loss of communication with the External Object Calculating Module/ EOCM_HCP1/EOCM3/ ACP2_MCU on CAN Bus 3.	Message is not received from controller for Message $210:	>10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	>= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Fuel Pump Driver Control Module	U18A2	This DTC monitors for a loss of communication with the Fuel Pump Driver Control Module.	Message is not received from controller for Message $0C3: Message $0C4: Message $0CB: Message $0CC: Message $125: Message $1E6: Message $2C1: Message $2D7: Message $2D9: Message $3C8: Message $3EB: Message $3EC: Message $3EE:	>10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	>= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				>10,000.00 milliseconds >10,000.00 milliseconds >10,000.00 milliseconds	If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with DC to DC Converter on Powertrain Sensor Bus	U18E2	This DTC monitors for a loss of communication with the DC to DC Converter on Powertrain Sensor Bus.	Message is not received from controller for Message $0A8: Message $1C9:	 >10,000.00 milliseconds >10,000.00 milliseconds	General Enable Criteria: All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Conroller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/ Crank: Power Mode is run	 >= 5,000.00 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					If calibratable low voltage disable mode is not Never Disabled IfOBDII: Run/Crank ignition voltage If Secure: Starter motor engaged for Or Run/Crank ignition voltage If Hybrid Secure: Run/Crank ignition voltage If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	>=11.00 Volts > 15,000.00 milliseconds > 8.41 Volts >=6.41 Volts Disabled >=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Key Table Not Provisioned / Authoritative Counter At Maximum	U1960	This DTC indicates that the ECU security peripheral key slots are not provisioned OR ECU message authenticatioon Authoritative Counters are at MAX value	During controller initialization:
			
			IF (Any Security Peripheral Key Slot reports as Empty)
			-OR-
			(Any Authoritative Counter is at MAX value)
			
			During controller operation:
			
			IF (A Security Peripheral Key Slot reports as Empty)
			-OR-
			(An Authoritative Counter is at MAX value)
					Calibration enable	= 1.00 Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
U1961 (Security Peripheral Performance)	U1961	This DTC indicates that the ECU security peripheral has reported that it has failed.	The ECU security peripheral reports that the security peripheral hardware has failed.		Calibration enable	= 1.00 Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
U1962 (Unable to Authenticate Serial Data Message)	U1962	This DTC indicates that serial data message authentication on any key slot has failed a configurable number of times this key cycle.	Message authentication on a single key slot has failed a configurable number of times.	KeSSAR_Cnt_SecKey SlotFailLimit	Calibration enable	= 1.00 Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Vehicle Identification Number of First Vehicle Not Programmed	U1978	This DTC checks that the VIN of the first vehicle is correctly written	At least one of the programmed VIN of the first vehicle digits	Not a valid ASCII value	Calibration enable	= 1	250 ms / test Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Odometer Vehicle Identification Number Not Programmed	U2A90	This DTC checks that the odometer VIN is correctly written	At least one of the programmed odometer VIN digits	Not a valid ASCII value	Calibration enable	= 1	250 ms / test Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Odometer Vehicle Identification Number Invalid Configuratio n	U2A91	This DTC checks that the odometer VIN matches the ECU VIN	At least one of the programmed odometer VIN digits	Does not match the ECU VIN digits.	Calibration enable	= 1	250 ms / test Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Input Power Circuit A - Ignition Input On/Start Circuit Correlation	U3023	Detect a Power A vs RuncCrank correlation error	Power A - RunCrank - Voltage	> 3.00	PowerA- RunCrank Correlation monitoring enable = TRUE Battey Present RunCrank Active Starter Motor NOT Engaged	Diagnostcis 1.00 Battey Present = TRUE RunCrank Active = TRUE Starter Motor Engaged = FALSE	50.00 failures out of 63.00	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Input Power A Circuit Low	U3501	Detects low voltage on Battery input 1. This diagnostic reports the DTC when low voltage is present.	Power A circuit Low	8.00	Power A check Low monitoring enable = TRUE Enable Starter motor criteria met (Starter motor not engaged) Enable engine speed criteria met (Engine speed higher than) Enable run crank criteria met	1.00 = 1.00 = 1.00 >=1,350.00 = 1.00	20.00 failures out of 25.00	Type C, 1 Trip No MIL Emissions Neutral

Initial Supporting table - CalculatedPerfMaxEd

Description: Maximum desired camshaft position for Exhaust CAM - Bank1

Value Units: Maximum desired camshaft position (degCam)
X Unit: Engine Oil Temperature (degC)
[1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17]
[-40 -28 -16 -4 8 20 32 44 56 68 80 92 104 116 128 140 152]

Y Units: Engine Speed (rpm)
[1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17]
[400 800 1200 1600 2000 2400 2800 3200 3600 4000 4400 4800 5200 5600 6000 6400 6800]

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
2	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
3	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
4	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
5	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
6	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
7	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
8	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
9	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
10	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
11	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
12	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
13	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
14	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
15	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
16	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
17	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0

Initial Supporting table - CalculatedPerfMaxIcl

Description: Maximum desired camshaft position for Intake CAM - Bank1

Value Units: Maximum desired camshaft position (degCam)
X Unit: Engine Oil Temperature (degC)
[1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17]
[-40 -28 -16 -4 8 20 32 44 56 68 80 92 104 116 128 140 152]
Y Units: Engine Speed (rpm)
[1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17]
[400 800 1200 1600 2000 2400 2800 3200 3600 4000 4400 4800 5200 5600 6000 6400 6800]

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
2	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
3	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
4	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
5	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
6	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
7	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
8	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
9	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
10	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
11	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
12	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
13	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
14	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
15	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
16	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
17	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0

Initial Supporting table - FastFailTempDiff

Description: EOT Sensor Cold Start Fast Fail Threshold

Value Units: Threshold between power-up engine oil temperature and power-up engine coolant temperature (Deg C)
X Unit: PowerUp coolant temperature (deg C)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	80.0	80.0	80.0	60.0	60.0	40.0	40.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

Initial Supporting table - P0196_TotalAccumulatedFlow

Description: Total accumulated air consumed by engine since engine start as a function of powerup undefaulted Oil Temperature

Value Units: Minimum accumulated (total) air grams consumed by engine (gram)
X Unit: PowerUp coolant temperature (deg C)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	15,000	14,000	13,000	12,000	11,000	10,000	9,000	8,000	7,000	6,000	5,000	4,000	5,000	4,000	3,000	3,000	3,000

Initial Supporting table - P0128 Maximum Acculated Energy - Primary

Description: KtETHD_E_EOR_WrmllpEnrgyLimTestO

Value Units: Cooling system energy failure threshold (kJ)
X Unit: Minimum ECT for the key cycle (°C)

y/x	-20.0	-5.0	10.0	30.0	45.0	60.0	75.0
1.0	9,168.2	9,168.2	9,168.2	6,389.2	4,305.0	2,220.7	2,220.7

Initial Supporting table - P0128 Maximum Acculated Energy - Secondary

Description: KtETHD_E_EOR_WrmllpEnrgyLimTest1

Value Units: Cooling system energy failure threshold (kJ)
X Unit: Minimum ECT for the key cycle (°C)

y/x	-20.0	-5.0	10.0	30.0	45.0	60.0	75.0
1.0	11,206.7	9,461.7	7,716.7	5,390.0	3,645.0	1,900.0	1,900.0

Initial Supporting table - P0128 Maximum Acculated Energy - Tertiary

Description: KtETHD_E_EOR_WrmllpEnrgyLimTest2

Value Units: Cooling system energy failure threshold (kJ)
X Unit: Minimum ECT for the key cycle (°C)

y/x	-20.0	-5.0	10.0	30.0	45.0	60.0	75.0
1.0	11,206.7	9,461.7	7,716.7	5,390.0	3,645.0	1,900.0	1,900.0

Initial Supporting table - P01F01- Heat To Coolant Min 2D

Description: KtETHD_P_CDD_HeatToCoolantMin

Value Units: Indicated Power (kW)
X Unit: Firing Fraction
Y Units: Ambient temperature (°C)

y/x	0.00	0.25	0.50	0.75	1.00
-9.0	16.0	16.0	16.0	16.0	20.0
0.0	16.0	16.0	16.0	16.0	20.0
10.0	16.0	16.0	16.0	16.0	11.0
20.0	16.0	16.0	16.0	16.0	11.0
50.0	16.0	16.0	16.0	16.0	11.0

Initial Supporting table - P0234 P0299: Desired torque minimum limit overAmbient pressure to enable the WG deviation diagnosis.

Description: Desired torque minimum limit overAmbient pressure to enable the WG deviation diagnosis.

Value Units: [M] Engine torque threshold
X Unit: [p] KnBSTD_p_WG_DevAmbAirPresBP - Ambient pressure

y/x	60	80	100
1	280	280	280

Initial Supporting table - P0234 P0299: Engine speed minimum limit over ambient pressure to enable the WG deviation diagnosis.

Description: Engine speed minimum limit over Ambient pressure to enable the WG deviation diagnosis.

Value Units: [rpm] Engine speed threshold
X Unit: [p] KnBSTD_p_WG_DevAmbAirPresBP - Ambient pressure

y/x	60	80	100
1	1,600	1,600	1,600

Initial Supporting table - P0234 P0299: WG position deviation diagnostic delay function of engine speed and ambient pressure

Description: Timer to stabilize enable conditions for wastegate position deviation diagnosis.

Value Units: [sec] Pressure control deviation diagnosis enable delay.
X Unit: [rpm] KnBSTD_n_WG_DevEngSpdBP - Engine Speed
Y Units: [kPa] KnBSTD_p_WG_DevAmbAirPresBP - Ambient Pressure

y/x	1,500	2,000	3,000	4,000	5,000	6,000	7,000
60	3	2	1	1	1	1	1
80	2	2	1	1	1	1	1
100	1	1	1	1	1	1	1

Initial Supporting table - P0299: Additive offset on WG negative deviation ambient correction.

Description: Additive offset on WG negative deviation ambient correction.

Value Units: [Pct] Position deviation ambient correction
X Unit: [kPa] KnBSTD_p_WG_DevAmbAirPresBP - Ambient Air Pressure
Y Units: [rpm] KnBSTD_n_WG_DevEngSpdBP - Engine Speed

y/x	60.0	80.0	100.0
1,500.0	0.0	0.0	0.0
2,000.0	0.0	0.0	0.0
3,000.0	0.0	0.0	0.0
4,000.0	0.0	0.0	0.0
5,000.0	0.0	0.0	0.0
6,000.0	0.0	0.0	0.0
7,000.0	0.0	0.0	0.0

Initial Supporting table - P0299: WG negative deviation fail threshold over engine speed and desired torque.

Description: WG negative deviation fail threshold over engine speed and desired torque.

Value Units: [Pct] Position deviation threshold
X Unit: [M] KnBSTD_M_WG_DevDsrdTrqBP - Desired Torque
Y Units: [rpm] KnBSTD_n_WG_DevEngSpdBP - Engine Speed

y/x	200	250	300	350	400	480
1,500	-14	-14	-14	-14	-18	-18
2,000	-14	-14	-14	-14	-18	-18
3,000	-14	-14	-14	-14	-18	-18
4,000	-14	-14	-14	-14	-19	-18
5,000	-18	-18	-18	-18	-18	-18
6,000	-18	-18	-18	-18	-18	-18
7,000	-18	-18	-18	-18	-18	-18

Initial Supporting table - P0446 canister vent restriction test displaced purge volume limit

Description: Canister vent restriction diagnostic displaced purge volume (liters) as a function of barometric pressure (kPa)

Value Units: Displaced purge volume (Liters)
X Unit: Barometric pressure (kPa)

y/x	70	80	90	100	110
1	12.0	12.0	12.0	12.0	12.0

Initial Supporting table - P0446 canister vent restriction test tank vacuum threshold

Description: Canister vent restriction diagnostic vacuum failure threshold (Pa) as a function of barometric pressure (kPa)

Value Units: Vacuum (Pa)
X Unit: Barometric pressure (kPa) - 70, 80, 90, 100, 110 kPa

y/x	1	2	3	4	5
1	3,000	3,000	3,000	3,000	3,000

Initial Supporting table - P0455 large leak diagnostic displaced purge volume threshold

Description: Large leak diagnostic displaced purge volume threshold as a function of barometric pressure

Value Units: Displaced purge volume threshold (liters)
X Unit: Barometric pressure (kPa)

y/x	70	80	90	100	110
1	10.0	10.0	10.0	10.0	10.0

Initial Supporting table - P0455 large leak diagnostic tank vacuum threshold

Description: Large leak diagnostic tank vacuum threshold as a function of barometric pressure

Value Units: Vacuum (Pa)
X Unit: Barometric pressure (kPa)

y/x	1	2	3	4	5
1	2,750	2,750	2,750	2,750	2,750

Initial Supporting table - P0496 purge valve leak diagnostic vacuum threshold

Description: Purge valve leak diagnostic vacuum failure threshold (Pa) as a function of barometric pressure (kPa)

Value Units: Vacuum (Pa)
X Unit: Barometric pressure (kPa)

y/x	1	2	3	4	5
1	2,500	2,500	2,500	2,500	2,500

Initial Supporting table - P0496 purge valve leak test time as a function of fuel level and barometric pressure

Description: Purge valve leak test time as a function of fuel level (%) and barometric pressure (kPa)

Value Units: Time (Seconds)
X Unit: Barometric pressure (kPa)
Y Units: Fuel level (%)

y/x	70	80	90	100	110
0	90	90	90	90	90
6	89	89	89	89	89
13	88	88	88	88	88
19	87	87	87	87	87
25	85	85	85	85	85
31	84	84	84	84	84
38	83	83	83	83	83
44	82	82	82	82	82
50	81	81	81	81	81
56	80	80	80	80	80
63	79	79	79	79	79
69	78	78	78	78	78
75	76	76	76	76	76
81	75	75	75	75	75
88	74	74	74	74	74
94	73	73	73	73	73
100	72	72	72	72	72

Initial Supporting table - P0521_CVDOP_MaxOilPressure

Description: Maximum oil pressure threshold.

X Unit: Engine Speed, RPM

y/x	40	50	60	70	80	90	100	110	120
1,000	820	820	820	820	820	820	820	820	820
1,500	820	820	820	820	820	820	820	820	820
2,000	820	820	820	820	820	820	820	820	820
2,500	820	820	820	820	820	820	820	820	820
3,000	820	820	820	820	820	820	820	820	820
3,500	820	820	820	820	820	820	820	820	820
4,000	820	820	820	820	820	820	820	820	820
4,500	820	820	820	820	820	820	820	820	820
5,000	820	820	820	820	820	820	820	820	820

Initial Supporting table - P0521_CVDOP_MinOilPresFail

Description: Minimum Oil Pressure fail Threshold

X Unit: Engine Speed (RPM)

y/x	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000
1	60	60	60	60	74	89	108	127	148

Initial Supporting table - P06DD_CVDOP_MaxDesPress

Description: The maximum desired pressure, above which the stuck diagnostic will be disabled.

Value Units: Desired oil pressure, kPa
X Unit: Engine oil temperature, °C

y/x	-1	0	20	60	80	100	120	140	160
1	450	450	450	450	450	450	250	210	205

Initial Supporting table - P06D)D_CVDOP_MaxPressErr

Description: Error threshold to set the oil pump performance fault.

Value Units: Absolute Oil Pressure Error, kPa
X Unit: Engine Speed, RPM
Y Units: Engine oil temperature, °C

y/x	600	1,000	1,500	2,000	3,000	4,000	5,000	6,000	7,000
-1	100	100	100	100	100	100	125	125	125
0	100	100	100	100	100	100	125	125	125
20	75	75	75	75	75	80	125	125	125
60	75	75	75	75	75	80	125	125	125
80	75	75	75	75	75	80	125	125	125
100	75	75	75	75	75	80	125	125	125
120	75	75	75	75	75	80	125	125	125
140	75	75	75	75	75	80	125	125	125
160	75	75	75	75	75	80	125	125	125

Initial Supporting table - P06DD_CVDOP_MinDesPres

Description: The minimum desired pressure, below which the stuck diagnostic will be disabled.

Value Units: Desired oil pressure, kPa
X Unit: Engine oil temperature, °C

y/x	-1	0	20	60	80	100	120	140	160
1	200	200	180	160	150	150	175	185	300

Initial Supporting table - P219A EWMA Coefficient

Description: The bank 1 EWMA coefficient used to filter the AFIM Variance Ratio.

Value Units: Unitless Scalar
X Unit: Unitless Scalar

y/x	-1.00	-0.50	0.00	0.50	1.00
1	0.06	0.06	0.06	0.06	0.06

Initial Supporting table - P219A EWMA Coefficient Opt Table

Description: The bank 1 EWMA coefficient used to filter the AFIM Variance Ratio while in Optional Mode, if used.

Value Units: Unitless Scalar
X Unit: Unitless Scalar

y/x	-1.00	-0.50	0.00	0.50	1.00
1.0	0.05	0.05	0.05	0.05	0.05

Initial Supporting table - P219A Quality Factor Bank1 Table

Description: Bank 1 lookup table of Quality Factors used in the calculation of the Ratio for the current sample period

Value Units: Unitless Scalar
X Unit: Engine Speed (RPM)
Y Units: Air Per Cylinder (APC) (mg/cylinder)

y/x	600	920	1,240	1,560	1,880	2,200	2,520	2,840	3,160	3,480	3,800	4,120	4,440	4,760	5,080	5,400	5,720
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
160	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
240	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
320	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
400	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
480	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
560	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
640	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
720	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
800	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
880	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
960	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1,040	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1,120	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1,200	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1,280	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1,360	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - P219A Wastegate Position Max Bank 1

Description: Wastegate Position Maximum Bank 1

Value Units: % percentage closed
X Unit: Engine Speed (RPM)
Y Units: Air Per Cylinder (APC)(mg/cylinder)

y/x	600	920	1,240	1,560	1,880	2,200	2,520	2,840	3,160	3,480	3,800	4,120	4,440	4,760	5,080	5,400	5,720
80	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
160	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
240	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
320	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
400	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
480	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
560	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
640	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
720	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
800	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
880	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
960	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
1,040	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
1,120	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
1,200	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
1,280	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
1,360	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101

Initial Supporting table - P219A Wastegate Position Min Bank 1

Description: Wastegate Position Minimum Bank 1

Value Units: % percentage closed
X Unit: Engine Speed (RPM)
Y Units: Air Per Cylinder (APC)(mg/cylinder)

y/x	600	920	1,240	1,560	1,880	2,200	2,520	2,840	3,160	3,480	3,800	4,120	4,440	4,760	5,080	5,400	5,720
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,040	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - P26CE Pump Overspeed Fail Threshold

Description:

Value Units: Pump overspeed failure threshold (RPM)
X Unit: Commanded pump speed (RPM)

y/x	0	300	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
1	-250	-250	-250	-300	-300	-400	-500	-600	-700	-800

Initial Supporting table - P26CE Pump Overspeed Fail Threshold Low Voltage

Description: Pump overspeed failure threshold in a low voltage condition as a function of pump requested speed

Value Units: Pump overspeed failure threshold low voltage (RPM)
X Unit: Commanded pump speed (RPM)

y/x	0	300	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
1	-9,999	-9,999	-9,999	-9,999	-9,999	-9,999	-9,999	-9,999	-9,999	-9,999

Initial Supporting table - P2B85 Pump Underspeed Fail Threshold

Description: Pump underspeed failure threshold as a function of pump requested speed

Value Units: Pump underspeed failure threshold (RPM)
X Unit: Commanded pump speed (RPM)

y/x	0	300	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
1	200	200	200	300	300	400	500	600	700	800

Initial Supporting table - P2B85 Pump Underspeed Fail Threshold Low Voltage

Description: Pump underspeed failure threshold in a low voltage condition as a function of pump requested speed

Value Units: Pump underspeed failure threshold low voltage (RPM)
X Unit: Commanded pump speed (RPM)

y/x	0	300	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
1	9,999	9,999	9,999	9,999	9,999	9,999	9,999	9,999	9,999	9,999

Initial Supporting table - P3075 3076 Pump Current Performance Coolant Distribution Mode

Description: Current performance intrusive test enable condition as a function of coolant distribution mode selection

Value Units: Coolant distribution mode selection to enable diagnostic
X Unit: Coolant distribution mode enumeration

y/x	0	1	2	3	4	5
1	1	0	0	0	0	0

Initial Supporting table - P3075 3076 Pump Current Performance Coolant System Mode Select

Description: Current performance intrusive test enable condition as a function of coolant system mode selection

Value Units: Coolant system mode selection to enable diagnostic
X Unit: Coolant System Mode Enumeration

y/x	CeETHR e_Clnt SysInit	CeETHR e_Clnt SysInitWait	CeETHR e_Clnt SysLowFlw	CeETHR e_Clnt SysNormal	CeETHR e_Clnt SysLowFlwAutoStoP	CeETHR e_Clnt SysNormalAutoStop	CeETHR e_Clnt SysAfterRunWait	CeETHR e_Clnt SysAfterRun	CeETHR e_Clnt SysRmdlAction1	CeETHR e_Clnt SysRmdlAction2	CeETHR e_Clnt SysRmdlAction3	CeETHR e_Clnt SysRmdlAction4	CeETHR e_Clnt SysServiceFilH	CeETHR e_Clnt SysServiceFill2	CeETHR e_Clnt SysServiceFill3	CeETHR e_Clnt SysServiceFill4	CeETHR e_Clnt SysServiceFill5	CeETHR e_Clnt SysServiceFill6	CeETHR e_Clnt SysServiceFill7	CeETHR e_Clnt SysServiceFill8	CeETHR e_Clnt SysServiceFill9	CeETHR e_Clnt SysServiceFilH0	CeETHR e_Clnt SysServiceFilH1	CeETHR e_Clnt SysServiceFilH2	CeETHR e_Clnt SysServiceFilH3	CeETHR e_Clnt SysServiceFilH4	CeETHR e_Clnt SysServiceFilH5	CeETHR e_Clnt SysServiceFill
1	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - P3075 3076 Pump Current Scaled

Description: Pump current scaled based on engine inlet coolant temperature

Value Units: Pump current scaled (A)
X Unit: Engine inlet coolant temperature (Deg C)

y/x	40	50	60	70	80	90	100	110	120	130
1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Initial Supporting table - P3075 Pump Low Current Passive Test Fail Threshold

Description: Low current passive test failure threshold as a function of pump command speed and flow restriction

Value Units: Pump passive test low current failure threshold (A)
X Unit: Coolant Flow Restriction (Unitless)
Y Units: Commanded Pump Speed (RPM)

y/x	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
810	1	3	3	3	3	3	3	3	3	3
1,000	1	3	3	3	3	3	3	3	3	3
1,200	1	3	3	3	4	4	4	4	4	4
1,600	1	3	3	3	4	4	4	4	4	4
2,000	1	4	5	5	5	6	6	6	6	6
2,500	1	6	7	7	8	8	9	9	9	10
3,000	1	9	10	10	11	11	12	12	13	14
4,000	1	15	16	16	19	20	21	21	23	24
5,000	1	23	25	25	29	30	32	33	35	37
6,250	1	35	39	39	45	47	49	52	54	57

Initial Supporting table - P3075 Pump Low Current Performance Failure Threshold

Description: Low current performance failure threshold as a function of coolant restriction correction

Value Units: Pump low current failure threshold (A)
X Unit: Coolant restriction correction

y/x	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
1	0.5	14.7	16.3	16.3	18.6	19.7	20.5	21.3	22.5	23.5

Initial Supporting table - P3076 Pump High Current Passive Test Fail Threshold

Description: High current passive test failure threshold as a function of pump command speed and flow restriction

Value Units: Pump passive test high current failure threshold (A)
X Unit: Coolant Flow Restriction (Unitless)
Y Units: Commanded Pump Speed (RPM)

y/x	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
810	75	4	4	4	4	4	4	4	4	4
1,000	75	4	4	4	4	4	4	4	4	4
1,200	75	4	4	4	4	4	5	5	5	5
1,600	75	5	5	5	5	5	5	6	6	6
2,000	75	5	6	6	7	7	7	7	8	8
2,500	75	8	9	9	10	10	11	11	11	12
3,000	75	11	12	13	14	14	15	15	16	17
4,000	75	18	20	23	23	24	26	26	28	29
5,000	75	28	31	35	36	38	39	41	43	45
6,250	75	43	48	55	56	59	62	63	67	70

Initial Supporting table - P3076 Pump High Current Performance Failure Threshold

Description:

Value Units: Pump high current failure threshold (A)
X Unit: Coolant restriction correction

y/x	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
1	75.0	18.1	20.1	22.9	23.3	24.5	25.6	26.4	27.6	28.8

Initial Supporting table - PmpPerf: Tabel to estimate the expected pump AC current based on the pump speed.

Description: Tabel to estimate the expected pump AC current based on the pump speed.

Value Units: [A] Expected AC current
X Unit: [rpm] KnlCPD_n_CAC_PumpSpeed

y/x	580	1,600	2,000	2,500	3,000	3,500	4,800
-40	1	1	2	3	4	5	9
0	1	1	2	3	4	5	9
40	1	1	2	3	4	5	9
95	1	1	2	3	4	5	9
120	1	1	2	3	4	7	13

Initial Supporting table - Purge Pump Diagnostic IAT Multiplier Factor

Description: Purge pump diagnostic IAT multiplier factor as a function of intake air temperature (deg C)

Value Units: Purge pump diagnostic IAT multiplier factor (unitless)
X Unit: Intake air temperature (deg C)

y/x	-40	-20	0	20	40	60	80	100	120
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - Purge Pump Misassembled Failure Threshold

Description: Misassembled failure threshold (kPa) as a function of barometric pressure (kPa) and purge pump speed (RPM)

Value Units: Misassembled failure threshold (kPa)
X Unit: Barometric pressure (kPa)
Y Units: Purge pump speed (RPM)

y/x	70	80	90	100	110
35,000	0.5	0.5	0.5	0.5	0.5
36,000	0.5	0.5	0.5	0.5	0.5
37,000	0.6	0.6	0.6	0.6	0.6
38,000	0.6	0.6	0.6	0.6	0.6
39,000	0.6	0.6	0.6	0.6	0.6
40,000	0.7	0.7	0.7	0.7	0.7
41,000	0.7	0.7	0.7	0.7	0.7
42,000	0.7	0.7	0.7	0.7	0.7
43,000	0.8	0.8	0.8	0.8	0.8
44,000	0.8	0.8	0.8	0.8	0.8
45,000	0.8	0.8	0.8	0.8	0.8
46,000	0.9	0.9	0.9	0.9	0.9
47,000	0.9	0.9	0.9	0.9	0.9
48,000	0.9	0.9	0.9	0.9	0.9
49,000	1.0	1.0	1.0	1.0	1.0
50,000	1.0	1.0	1.0	1.0	1.0
51,000	1.1	1.1	1.1	1.1	1.1

Initial Supporting table - Purge pump performance high flow ratio threshold

Description: Purge pump flow ratio = estimated purge flow as func(pressure across purge solenoid valve) / failure threshold purge flow as func(purge valve duty cycle, barometric pressue)

Value Units: Purge pump flow ratio (unitless)
X Unit: Barometric pressure (kPa)
Y Units: Purge solenoid duty cycle (Percent)

y/x	70	80	90	100	110
0	14.4	16.2	18.0	20.1	21.7
6	14.4	16.2	18.0	20.1	21.7
12	14.4	16.2	18.0	20.1	21.7
18	14.4	16.2	18.0	20.1	21.7
24	14.4	16.2	18.0	20.1	21.7
30	14.4	16.2	18.0	20.1	21.7
36	14.4	16.2	18.0	20.1	21.6
42	14.3	16.1	17.9	20.0	21.6
48	14.2	16.0	17.8	19.8	21.4
54	14.1	15.9	17.6	19.6	21.2
60	13.9	15.7	17.4	19.4	20.9
66	13.7	15.4	17.2	19.1	20.6
72	13.5	15.2	16.9	18.8	20.2
78	13.3	14.9	16.6	18.4	19.9
84	13.0	14.6	16.2	18.0	19.5
90	12.7	14.2	15.8	17.6	19.2
100	12.2	13.7	15.2	16.9	18.6

Initial Supporting table - Purge pump performance low flow ratio threshold

Description: Purge pump flow ratio = Estimated purge flow as func(pressure across purge solenoid valve) / failure threshold purge flow as func(purge valve duty cycle, barometric pressure)

Value Units: Purge pump flow ratio (unitless)
X Unit: Barometric pressure (kPa)
Y Units: Purge solenoid duty cycle (Percent)

y/x	70	80	90	100	110
0	2.2	2.3	2.4	2.5	2.6
6	2.1	2.2	2.3	2.4	2.5
12	2.0	2.1	2.2	2.3	2.4
18	1.9	2.0	2.2	2.3	2.4
24	1.9	2.0	2.1	2.2	2.3
30	1.8	1.9	2.0	2.1	2.2
36	1.7	1.8	1.9	2.0	2.1
42	1.6	1.7	1.8	1.9	2.1
48	1.5	1.6	1.7	1.9	2.0
54	1.4	1.5	1.7	1.8	1.9
60	1.3	1.5	1.6	1.7	1.8
66	1.2	1.4	1.5	1.6	1.7
72	1.2	1.3	1.4	1.5	1.7
78	1.1	1.2	1.3	1.5	1.6
84	1.0	1.1	1.2	1.4	1.5
90	0.9	1.0	1.2	1.3	1.4
100	0.9	1.0	1.2	1.3	1.4

Initial Supporting table - Purge pump speed on value too high

Description: Purge pump speed (RPM) error limit as a function of purge pump voltage (volts)

Value Units: Purge pump speed (RPM)
X Unit: Purge pump voltage (volts)

y/x	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000

Initial Supporting table - Purge pump speed on value too low

Description: Purge pump speed (RPM) error limit as a function of purge pump voltage (volts)

Value Units: Purge pump speed (RPM)
X Unit: Purge pump voltage (volts)

y/x	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	29,400	29,400	29,400	32,100	34,700	36,700	38,600	39,300	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000

Initial Supporting table - Purge System High Purge Flow Enable

Description: Purge gas flow ratio (unitless) as a function of barometric pressure (kPa)

Value Units: Purge pump flow ratio (unitless)
X Unit: Barometric pressure (kPa)

y/x	1	2	3	4	5
1	1.1	1.1	1.1	1.1	1.1
2	1.1	1.1	1.1	1.1	1.1
3	1.1	1.1	1.1	1.1	1.1
4	1.1	1.1	1.1	1.1	1.1
5	1.1	1.1	1.1	1.1	1.1
6	1.1	1.1	1.1	1.1	1.1
7	1.1	1.1	1.1	1.1	1.1
8	1.1	1.1	1.1	1.1	1.1
9	1.1	1.1	1.1	1.1	1.1
10	1.1	1.1	1.1	1.1	1.1
11	1.1	1.1	1.1	1.1	1.1
12	1.1	1.1	1.1	1.1	1.1
13	1.1	1.1	1.1	1.1	1.1
14	1.1	1.1	1.1	1.1	1.1
15	1.1	1.1	1.1	1.1	1.1
16	1.1	1.1	1.1	1.1	1.1
17	1.1	1.1	1.1	1.1	1.1

Initial Supporting table - Purge System High Purge Flow Remain Enabled

Description: Purge gas flow ratio (unitless) as a function of barometric pressure (kPa)

Value Units: Purge pump flow ratio (unitless)
X Unit: Barometric pressure (kPa)

y/x	1	2	3	4	5
1	1.2	1.2	1.2	1.2	1.2
2	1.2	1.2	1.2	1.2	1.2
3	1.2	1.2	1.2	1.2	1.2
4	1.2	1.2	1.2	1.2	1.2
5	1.2	1.2	1.2	1.2	1.2
6	1.2	1.2	1.2	1.2	1.2
7	1.2	1.2	1.2	1.2	1.2
8	1.2	1.2	1.2	1.2	1.2
9	1.2	1.2	1.2	1.2	1.2
10	1.2	1.2	1.2	1.2	1.2
11	1.2	1.2	1.2	1.2	1.2
12	1.2	1.2	1.2	1.2	1.2
13	1.2	1.2	1.2	1.2	1.2
14	1.2	1.2	1.2	1.2	1.2
15	1.2	1.2	1.2	1.2	1.2
16	1.2	1.2	1.2	1.2	1.2
17	1.2	1.2	1.2	1.2	1.2

Initial Supporting table - Purge System Low Purge Flow Enable

Description: Purge gas flow ratio (unitless) as a function of barometric pressure (kPa)

Value Units: Purge pump flow ratio (unitless)
X Unit: Barometric pressure (kPa)

y/x	1	2	3	4	5
1	-0.1	-0.1	-0.1	-0.1	-0.1
2	-0.1	-0.1	-0.1	-0.1	-0.1
3	-0.1	-0.1	-0.1	-0.1	-0.1
4	-0.1	-0.1	-0.1	-0.1	-0.1
5	-0.1	-0.1	-0.1	-0.1	-0.1
6	-0.1	-0.1	-0.1	-0.1	-0.1
7	-0.1	-0.1	-0.1	-0.1	-0.1
8	-0.1	-0.1	-0.1	-0.1	-0.1
9	-0.1	-0.1	-0.1	-0.1	-0.1
10	-0.1	-0.1	-0.1	-0.1	-0.1
11	-0.1	-0.1	-0.1	-0.1	-0.1
12	-0.1	-0.1	-0.1	-0.1	-0.1
13	-0.1	-0.1	-0.1	-0.1	-0.1
14	-0.1	-0.1	-0.1	-0.1	-0.1
15	-0.1	-0.1	-0.1	-0.1	-0.1
16	-0.1	-0.1	-0.1	-0.1	-0.1
17	-0.1	-0.1	-0.1	-0.1	-0.1

Initial Supporting table - Purge System Low Purge Flow Remain Enabled

Description: Purge gas flow ratio (unitless) as a function of barometric pressure (kPa)

Value Units: Purge pump flow ratio (unitless)
X Unit: Barometric pressure (kPa)

y/x	1	2	3	4	5
1	-0.2	-0.2	-0.2	-0.2	-0.2
2	-0.2	-0.2	-0.2	-0.2	-0.2
3	-0.2	-0.2	-0.2	-0.2	-0.2
4	-0.2	-0.2	-0.2	-0.2	-0.2
5	-0.2	-0.2	-0.2	-0.2	-0.2
6	-0.2	-0.2	-0.2	-0.2	-0.2
7	-0.2	-0.2	-0.2	-0.2	-0.2
8	-0.2	-0.2	-0.2	-0.2	-0.2
9	-0.2	-0.2	-0.2	-0.2	-0.2
10	-0.2	-0.2	-0.2	-0.2	-0.2
11	-0.2	-0.2	-0.2	-0.2	-0.2
12	-0.2	-0.2	-0.2	-0.2	-0.2
13	-0.2	-0.2	-0.2	-0.2	-0.2
14	-0.2	-0.2	-0.2	-0.2	-0.2
15	-0.2	-0.2	-0.2	-0.2	-0.2
16	-0.2	-0.2	-0.2	-0.2	-0.2
17	-0.2	-0.2	-0.2	-0.2	-0.2

Initial Supporting table - TimeForOilAeration

Description: The timer limit to declare an engine oil aeration condition exists.

X Unit: Engine oil temperature (deg C)

y/x	-40	-15	5	10	15	20	80	100	120	140	160
1	30	30	30	30	30	30	30	30	30	30	30

Initial Supporting table - P0330_OpenCktThrshMax2 (20kHz)

Description: Max threshold table for the 20 KHz portion of the open circuit diagnostic for sensor 2. The lookup into this table will be filtered to define the max threshold for the filtered intensity. To fail, the filtered intensity needs to fall between this cal and the min cal filters.

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	7.768	7.758	7.752	7.754	7.748	7.744	7.760	7.781	7.795	7.592	6.982	6.600	6.215	6.215	6.215	6.215	6.215

Initial Supporting table - P0330_OpenCktThrshMax2 (NN)

Description: Max threshold table for the Normal Noise for sensor 2. The lookup into this table will be filtered to define the max threshold for the filtered intensity. To fail, the filtered intensity needs to fall between this cal and the min cal filters.

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	1.500	1.500	1.500	1.400	1.199	0.850	0.711	0.619	0.480	0.480	0.480	0.480	0.480	0.480	0.480	0.480	0.480

Initial Supporting table - P0330_OpenCktThrshMin2 (20 kHz)

Description: Min threshold table for the Normal Noise portion of the open circuit diagnostic. The lookup into this table will be filtered to define the max threshold for the filtered intensity. To fail, the filtered intensity needs to fall between this cal and the max cal filters.

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.600	2.699	2.699	2.699	2.699	2.699	2.699	2.699	2.699	2.699

Initial Supporting table - P0330_OpenCktThrshMin2 (NN)

Description: Min threshold table for the Normal Noise portion of the open circuit diagnostic for sensor 2. The lookup into this table will be filtered to define the max threshold or the filtered intensity. To fail, the filtered intensity needs to fall between this cal and the max cal filters.

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.244	0.186	0.119	0.127	0.078	0.053	0.037	0.025	0.020	0.045	0.047	0.043	0.000	0.000	0.000	0.000	0.000

Initial Supporting table - P0331_AbnormalLo2

Description: The low limit (no Hi limit, left for excessive knock) for sensor 2 for the performance diagnostic, abnormal noise; used for per sensor and per cyl performance diagnostics. The lookup in this table as a function of RPM and APC is then filtered using KeKNKD_k_PerfAbnFilter (KeKNKD_k_PerfCylAbnFilter for per cyl), and then this filtered quantity VaKNKD_k_PerfAbnFiltlLimitLo (VaKNKD_k_PerfCylAbnFiltlLimitLo for per cyl) becomes the actual limit. The code will immediately set if the filtered intensity goes below the filtered threshold

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250

Initial Supporting table - P0331_AbnormalLoAFM_2

Description: The low limit for AFM mode (no Hi limit, left for excessive knock) for sensor 2 for the performance diagnostic, abnormal noise; used for per sensor and per cyl performance diagnostics. The lookup in this table as a function of RPM and APC is then filtered using KeKNKD_k_PerfAbnFilter (KeKNKD_k_PerfCylAbnFilter for per cyl), and then this filtered quantity VaKNKD_k_PerfAbnFiltlLimitLo (VaKNKD_k_PerfCylAbnFiltlLimitLo for per cyl) becomes the actual limit. The code will immediately set if the filtered intensity goes below the filtered threshold

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250

Initial Supporting table - P04DB: Crankcase Pressure Noise Normalization for Engine Speed, high case

Description: Value to normalize the Crankcase Pressure signal noise based on engine speed, high case

Value Units: Scaling Factor for Noise (Unitless)
X Unit: Engine Speed (RPM)
Y Units: None

y/x	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - P04DB: Crankcase Pressure Noise Normalization for Engine Speed, low case

Description: Value to normalize the Crankcase Pressure signal noise based on engine speed, low case

Value Units: Scaling Factor for Noise (Unitless)
X Unit: Engine Speed (RPM)
Y Units: None

y/x	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Initial Supporting table - P04DB: Crankcase Pressure Signal Normalization for Air Flow, high case

Description: Value to normalize the Crankcase Pressure signal based on engine air flow, low case

Value Units: Scaling Factor for Signal (Unitless)
X Unit: Engine Air Flow (Grams/Second)
Y Units: None

y/x	70	80	90	100	115	130	145	160	200
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - P04DB: Crankcase Pressure Signal Normalization for Air Flow, low case

Description: Value to normalize the Crankcase Pressure signal based on engine air flow, low case

Value Units: Scaling Factor for Signal (Unitless)
X Unit: Engine Air Flow (Grams/Second)
Y Units: None

y/x	70	80	90	100	115	130	145	160	200
1	3.00	2.50	2.00	1.50	1.10	0.87	0.72	0.63	0.63

Initial Supporting table - P04DB: MAP Transient Delay Active Time

Description: MAP Transient Delay Active Time

Value Units: MAP Transient Delay (seconds*10)
X Unit: MAP Transient Delta (kPa)
Y Units: None

y/x	175.0	185.0	196.0	207.0	218.0	239.0	240.0
1	0	0	0	0	0	0	0

Initial Supporting table - P04DB: MAP Transient Delta Threshold

Description: MAP Transient Delta Threshold

Value Units: MAP Transient Delta (kPa)
X Unit: Engine Speed (RPM)
Y Units: None

y/x	500	800	1,100	1,400	1,700	2,000	2,300
1	999.0	999.0	999.0	999.0	999.0	999.0	999.0

Initial Supporting table - P06B7_OpenTestCktMax2

Description: Max threshold table for the 20 KHz for the test circuit diagnostic for sensor 2. The lookup into this table will be filtered to define the max threshold for the filtered intensity. To fail, the filtered intensity needs to fall between this cal and the min cal filters.

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.049	0.100	0.119	0.180	0.299	0.398	0.510	0.520	0.529	0.750	1.100	1.398	1.600	1.799	2.000	2.199	2.398

Initial Supporting table - P06B7_OpenTestCktMin2

Description: Min threshold table for the 20 KHz for the test circuit diagnostic for sensor 2. The lookup into this table will be filtered to define the max threshold for the filtered intensity. To fail, the filtered intensity needs to fall between this cal and the max cal filters.

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.000	0.000	0.000	0.020	0.020	0.049	0.078	0.119	0.129	0.158	0.180	0.199	0.219	0.260	0.299	0.318	0.340

Initial Supporting table - PmpSpdPerfDiagDly

Description:

y/x	-40	0	40	95	120
1	60	20	10	5	5

Initial Supporting table - PumpSpdPerfErrorLim

Description:

y/x	580	1,600	2,000	2,500	3,000	3,500	4,800
1	250	550	750	1,000	1,250	1,500	2,025

Initial Supporting table - P'129F Threshold High

Description: P129F Filtered Fuel Pump Speed Error High Threshold [over-performing motor]
Instantaneously calculated filtered pump speed error measured is higher than commanded

Value Units: revs / min
X Unit: revs / min [commanded pump speed]
Y Units: kiloPascals [requested fuel pressure]

y/x	200.0	300.0	400.0	500.0	600.0
1,000.0	-675.0	-675.0	-675.0	-675.0	-675.0
2,000.0	-675.0	-675.0	-675.0	-675.0	-675.0
3,000.0	-675.0	-675.0	-675.0	-675.0	-675.0
4,000.0	-675.0	-675.0	-675.0	-675.0	-675.0
5,000.0	-675.0	-675.0	-675.0	-675.0	-675.0
6,000.0	-675.0	-675.0	-675.0	-675.0	-675.0
7,000.0	-1,200.0	-1,200.0	-1,200.0	-1,200.0	-1,200.0

Initial Supporting table - P129F Threshold Low

Description: P129F Filtered Fuel Pump Speed Error Low Threshold [under-performing motor]
Instantaneously calculated filtered pump speed error measured is lower than commanded

Value Units: revs / min
X Unit: revs / min [commanded pump speed]
Y Units: kiloPascals [requested fuel pressure]

y/x	200.0	300.0	400.0	500.0	600.0
1,000.0	675.0	675.0	675.0	675.0	675.0
2,000.0	675.0	675.0	675.0	675.0	675.0
3,000.0	675.0	675.0	675.0	675.0	675.0
4,000.0	675.0	675.0	675.0	675.0	675.0
5,000.0	675.0	675.0	675.0	675.0	675.0
6,000.0	675.0	675.0	675.0	675.0	675.0
7,000.0	1,200.0	1,200.0	1,200.0	1,200.0	1,200.0

Initial Supporting table - P3187_Threshold

Description: P3187 Filtered Fuel Pressure Error Threshold [under-performing pump]

Value Units: kilo Pascals
X Unit: kPa [commanded fuel pressure]
Y Units: grams / sec [fuel flow]

y/x	200.00	250.00	300.00	350.00	400.00	450.00	500.00	550.00	600.00
0.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
1.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
3.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
4.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
6.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
7.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
9.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
10.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
12.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
13.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
15.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
16.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
18.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
19.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
21.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
22.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
24.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
25.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
27.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
28.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
30.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
31.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
33.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
34.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
36.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
37.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
39.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
40.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
42.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
43.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
45.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00

Initial Supporting table • P3187_Threshold

46.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00
48.00	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00

Initial Supporting table - P3188_Threshold

Description: P3188 Filtered Fuel Pressure Error Threshold [over-performing pump]

Value Units: kilo pascals [kPa]
X Unit: kPa [commanded fuel pressure]
Y Units: grams/sec [fuel flow]

y/x	200.00	250.00	300.00	350.00	400.00	450.00	500.00	550.00	600.00
0.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
1.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
3.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
4.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
6.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
7.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
9.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
10.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
12.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
13.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
15.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
16.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
18.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
19.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
21.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
22.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
24.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
25.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
27.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
28.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
30.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
31.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
33.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
34.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
36.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
37.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
39.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
40.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
42.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
43.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
45.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00

Initial Supporting table • P3188_Threshold

46.50	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00
48.00	-490.00	-440.00	-390.00	-340.00	-290.00	-240.00	-190.00	-140.00	-90.00

Initial Supporting table - DFCO Active Maximum Time (seconds)

Description: DFCO active maximum time versus engine airflow (gps)

Value Units: Time (seconds)
X Unit: Engine airflow (gps)

y/x	2	3	4	6	8	10	12	14	16	18	20	25	30	35	40	50	60
1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Initial Supporting table - DFCO Active Minimum Time (seconds)

Description: DFCO active minimum time versus engine airflow (gps)

Value Units: Time (seconds)
X Unit: Engine airflow (gps)

y/x	2	3	4	6	8	10	12	14	16	18	20	25	30	35	40	50	60
1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Initial Supporting table - Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests

Description: This table describes the adaptive (Block Learn) cells in which to enable the Post (Secondary) Oxygen sensor response tests.
Note: When the table column heading matches the calibration value below it, that individual cell is enabled.

The cell numbers in the table are defined as:

CeFADR_e_CellOO_PurgOnAirMode5 = 0,
CeFADR_e_Cell01_PurgOnAirMode4 = 1,
CeFADR_e_Cell02_PurgOnAirMode3 = 2,
CeFADR_e_Cell03_PurgOnAirMode2 = 3,
CeFADR_e_Cell04_PurgOnAirMode1 = 4,
CeFADR_e_Cell05_PurgOnAirModeO = 5,
CeFADR_e_Cell06_PurgOnIdle = 6,
CeFADR_e_Cell07_PurgOnDecel = 7,
CeFADR_e_Cell08_PurgOffAirMode5 = 8,
CeFADR_e_Cell09_PurgOffAirMode4 = 9,
CeFADR_e_Cell10_PurgOffAirMode3 = 10,
CeFADR_e_Cell11_PurgOffAirMode2 = 11,
CeFADR_e_Cell12_PurgOffAirMode1 = 12,
CeFADR_e_Cell13_PurgOffAirModeO = 13,
CeFADR_e_Cell14_PurgOffIdle = 14,
CeFADR_e_Cell15_PurgOffDecel = 15

Value Units: Block Learn cell number
X Unit: Block Learn cell number

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	7	7	7	7	7	7	7	7	15	15	15	15	15	15	15	15

Initial Supporting table - Multiple DTC Use Green Sensor Delay Criteria - Limit

Description: This Calibration is the acculmulated airflow limit above which the Green condition is expired
Used for: P0133, P013A, P013B, P013C, P013D, P013E, P013F, P014A, P014B, P0153, P015A, P015B, P015C, P015D, P1133, P1153, P2270, P2271, P2272 and P2273.
Note: This feature is only enabled when the vehicle is new and cannot be enabled in service.

Value Units: Grams
X Unit: Acculmulated Engine Airflow

y/x	CiOXYR_O2_Bank1_Sensor1	CiOXYR_O2_Bank1_Sensor2	CiOXYR_O2_Bank2_Sensor1	CiOXYR_O2_Bank2_Sensor2
1	120,000	120,000	120,000	120,000

Initial Supporting table - POC11_CamPosErrorLimIc1

Description: Maximum Intake Cam 1 phase error as a function of engine speed and engine oil temperature.

Value Units: Maximum Intake Cam 1 phase error (degCAM)
X Unit: Engine Oil Temperature (degC)
Y Units: Engine Speed (rpm)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
800	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1,200	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1,600	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
2,000	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
2,400	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
2,800	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
3,200	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
3,600	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
4,000	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
4,400	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
4,800	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
5,200	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
5,600	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6,000	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6,400	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6,800	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0

Initial Supporting table - P0011_P0021_P05CC_P05CD_EngOilPressEnbllc

Description: Delay time before the oil pressure enable flag is set assuming all the oil pressure enable criteria are met

Value Units: Time (sec)
X Unit: Engine Coolant Temperature (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - P0011_P0021_P05CC_P05CD_HiEngSpdHiDsbllc

Description: Minimum engine speed to disable Intake cam

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000

Initial Supporting table - P0011_P0021_P05CC_P05CD_HiEngSpdLoEnbllc

Description: Maximum engine speed to enable Intake cam - works as hysteresis.

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800

Initial Supporting table - P0011_P0021_P05CC_P05CD_LoPresHiEnbllc

Description: Intake cam is enabled when oil pressure exceeds this value

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130

Initial Supporting table - P0011_P0021_P05CC_P05CD_LoPresLoDsbllc

Description: Intake cam is disabled when oil pressure falls below this value

Value Units: Engine Oil Pressure (kPa)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120

Initial Supporting table - P0011_P0021_P05CC_P05CD_LoRpmHiEnbllc

Description: Intake cam is enabled when engine speed exceeds this value.

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500

Initial Supporting table - P0011_P0021_P05CC_P05CD_LoRpmLoDsbllc

Description: Intake cam is disabled when engine speed is below this value.

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400

Initial Supporting table - P0011_P0021_P05CC_P05CD_P0014_P0024_P05CE_P05CF_ColdStartEngRunning

Description: Engine running time must be greater than this threshold during a cold start to enable cam phasing

Value Units: Time (sec)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	24	24	18	4	4	3	3	3	3	3	3	2	2	2	2	2	2

Initial Supporting table - P0011_P(05CC_StablePositionTimeIc1

Description: Minimum time for Intake Cam 1 phase position to be stable to enable performance diagnostic.

Value Units: Minimum time (sec)
X Unit: Engine Oil Temperature (degC)
Y Units: Engine Speed (rpm)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
800	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1,200	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1,600	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2,000	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2,400	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2,800	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
3,200	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
3,600	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4,000	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4,400	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4,800	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5,200	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5,600	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6,000	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6,400	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6,800	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Initial Supporting table - P00114_CamPosErrorLimEc1

Description: Maximum Exhaust Cam 1 phase error as a function of engine speed and engine oil temperature.

Value Units: Maximum Exhaust Cam 1 phase error (degCAM)
X Unit: Engine Oil Temperature (degC)
Y Units: Engine Speed (rpm)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
800	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1,200	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1,600	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
2,000	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
2,400	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
2,800	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
3,200	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
3,600	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
4,000	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
4,400	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
4,800	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
5,200	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
5,600	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6,000	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6,400	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6,800	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0

Initial Supporting table - P0014_P0024_P05CE_P05CF_EngOilPressEnblEc

Description: Delay time before the oil pressure enable flag is set assuming all the oil pressure enable criteria are met

Value Units: Time (sec)
X Unit: Engine Coolant Temperature (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	14	12	9	6	4	3	3	3	3	2	2	2	2	2	2	2	2

Initial Supporting table - P0014_P0024_P05CE_P05CF_HiEngSpdHiDsblEc

Description: Exhaust cam is disabled when engine speed exceeds this value

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000

Initial Supporting table - P0014_P0024_P05CE_P05CF_HiEngSpdLoEnblEc

Description: Exhaust cam is enabled when engine speed remains below this value

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800

Initial Supporting table - P0014_P0024_P05CE_P05CF_LoPresHiEnblEc

Description: Exhaust cam is enabled when oil pressure exceeds this value

Value Units: Engine Oil Pressure (kPa)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130

Initial Supporting table - P0014_P0024_P05CE_P05CF_LoPresLoDsblEc

Description: Exhaust cam is disabled when oil pressure falls below this value

Value Units: Engine Oil Pressure (kPa)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120

Initial Supporting table - P0014_P0024_P05CE_P05CF_LoRpmHiEnblEc

Description: Exhaust cam is enabled when engine speed exceeds this value.

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500

Initial Supporting table - P0014_P0024_P05CE_P05CF_LoRpmLoDsblEc

Description: Exhaust cam is disabled when engine speed is below this value.

Value Units: Engine Speed (rpm)
X Unit: Engine Oil Temp (degC)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400

Initial Supporting table - P0014_PO)5CE_StablePositionTimeEc1

Description: Minimum time for Exhaust Cam 1 phase position to be stable to enable performance diagnostic.

Value Units: Minimum time (sec)
X Unit: Engine Oil Temperature (degC)
Y Units: Engine Speed (rpm)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
800	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1,200	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1,600	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2,000	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2,400	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2,800	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
3,200	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
3,600	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4,000	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4,400	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4,800	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5,200	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5,600	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6,000	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6,400	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
6,800	100.0	80.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Initial Supporting table - P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold

Description: P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold

Value Units: Engine Run Time- Seconds
X Unit: Oil Temperature- C

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	25.0	10.0	7.0	5.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Initial Supporting table - P0016-0019 Mid-Park Phaser Delay

Description: P0016-0019 Mid-Park Phaser Park Delay. Total delay is twice the calibration value as both 'hi' side and 'lo' side park check sequences are delayed by the stated calibration values

Value Units: Time - seconds
X Unit: Oil Temperature - degC

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	50.0	24.0	14.0	10.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Initial Supporting table - P0071: OAT Performance Drive Equilibrium Engine Off

Description: OAT Performance Diagnostic counter increment for determining OAT-IAT equilibrium for engine off (for hybrid applications)

Value Units: Counter Increment Value (Unitless)
X Unit: Vehicle Speed (KPH)

y/x	0.0	5.0	10.0	15.0	20.0	25.0	30.0	50.0	80.0
1.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0

Initial Supporting table - P0071: OAT Performance Drive Equilibrium Engine Running

Description: OAT Performance Diagnostic counter increment for determining OAT-IAT equilibrium for engine running

Value Units: Counter Increment Value (Unitless)
X Unit: Vehicle Speed (KPH)
Y Units: Engine Air Flow (Grams/Second)

y/x	0.0	5.0	10.0	15.0	20.0	25.0	30.0	50.0	80.0
1.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
5.0	-5.0	-2.0	-1.0	0.0	1.0	2.0	3.0	4.0	5.0
10.0	-4.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0
20.0	-2.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0
30.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0
40.0	0.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0
50.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
60.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
70.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0

Initial Supporting table - P00C4 P2261: Compressor Surge Line

Description: Turbo compressor recirculation valve diagnosis surge area limit.

Value Units: [ratio] CRV diagnosis surge area limit.
X Unit: [g/sec[] KnBSTD_dm_AirFlowBP - Air FLow

y/x	10.00	23.55	38.75	87.98	108.54	204.86
1	1.030	1.165	1.495	2.350	2.770	3.275

Initial Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: MAPI Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAPI Residual Weight Factor based on RPM

Value Units: Weight Factor (Unitless)
X Unit: Engine Speed (RPM)

y/x	750	1,250	1,750	2,000	2,500	3,000	3,250	3,500	4,000	4,250	4,500	4,750	5,000	5,250	5,500	5,750	6,000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Initial Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAP2 Residual Weight Factor based on RPM

Value Units: Weight Factor (Unitless)
X Unit: Engine Speed (RPM)

y/x	750	1,250	1,750	2,000	2,500	3,000	3,250	3,500	4,000	4,250	4,500	4,750	5,000	5,250	5,500	5,750	6,000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.995	0.928	0.912	0.941	0.941

Initial Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAP3 Residual Weight Factor based on RPM

Value Units: Weight Factor (Unitless)
X Unit: Engine Speed (RPM)

y/x	750	1,250	1,750	2,000	2,500	3,000	3,250	3,500	4,000	4,250	4,500	4,750	5,000	5,250	5,500	5,750	6,000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.929	0.914	0.945	0.945

Initial Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 TPS Residual Weight Factor based on RPM

Value Units: Weight Factor (Unitless)
X Unit: Engine Speed (RPM)

y/x	750	1,250	1,750	2,000	2,500	3,000	3,250	3,500	4,000	4,250	4,500	4,750	5,000	5,250	5,500	5,750	6,000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P0236_P1101 TIAP Residual Weight Factor based on RPM

Value Units: Weight Factor (Unitless)
X Unit: Engine Speed (RPM)

y/x	750	1,250	1,750	2,000	2,500	3,000	3,250	3,500	4,000	4,250	4,500	4,750	5,000	5,250	5,500	5,750	6,000
1	1.000	1.000	1.000	0.876	0.916	0.912	0.942	0.897	0.977	0.884	0.854	0.762	0.736	0.709	0.701	0.635	0.635

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max Air Flow

Value Units: Engine Air Flow (Grams/Second)
X Unit: Engine Speed (RPM)

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	13.0	17.0	21.0	29.0	35.0	40.0	50.0	58.0	58.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max MAP

Value Units: Manifold Pressure (kPa)
X Unit: Engine Speed (RPM)

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	90.0	90.0	80.0	76.0	73.0	70.0	72.0	73.0	73.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Offset

Value Units: Pressure Difference (kPa)
X Unit: Engine Speed (RPM)

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	0.0	0.1	0.5	1.1	2.1	3.3	5.3	7.2	7.2

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min Air Flow

Value Units: Engine Air Flow (Grams/Second)
X Unit: Engine Speed (RPM)

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	20.0	40.0	60.0	85.0	73.0	80.0	87.0	113.0	113.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min MAP

Value Units: Manifold Pressure (kPa)
X Unit: Engine Speed (RPM)

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	100.0	105.0	110.0	115.0	105.0	105.0	105.0	113.0	113.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Offset

Value Units: Pressure Difference (kPa)
X Unit: Engine Speed (RPM)

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	2.0	2.0	3.1	5.0	7.0	9.5	11.5	13.0	13.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

Description: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix - This table describes combinations of individual model failures that will set P0101, P0106, P0121, P0236 and P1101 on turbocharged applications.

Value Units: Boolean
X Unit: Unitless (See top line for heading information)
Y Units: Unitless

y/x	1	2	3	4	5	6	7	8	9
1	MAF Model	MAPI Model	MAP2 Model	MAP3 Model	TIAP1 Model	TPS Model	TIAP Correlation	TIAP Correlation	DTC Set
2	Failed	Failed	Failed	Failed	Failed	Failed	Failed	Valid	
3	F	F	F	F	F	F	F	F	No DTC
4	F	F	F	F	F	F	F	T	No DTC
5	F	F	F	F	F	F	T	F	No DTC
6	F	F	F	F	F	F	T	T	No DTC
7	F	F	F	F	F	T	F	F	No DTC
8	F	F	F	F	F	T	F	T	No DTC
9	F	F	F	F	F	T	T	F	No DTC
10	F	F	F	F	F	T	T	T	No DTC
11	F	F	F	F	T	F	F	F	No DTC
12	F	F	F	F	T	F	F	T	No DTC
13	F	F	F	F	T	F	T	F	No DTC
14	F	F	F	F	T	F	T	T	No DTC
15	F	F	F	F	T	T	F	F	P1101
16	F	F	F	F	T	T	F	T	P0121
17	F	F	F	F	T	T	T	F	P1101
18	F	F	F	F	T	T	T	T	P0236
19	F	F	F	T	F	F	F	F	No DTC
20	F	F	F	T	F	F	F	T	No DTC
21	F	F	F	T	F	F	T	F	P1101
22	F	F	F	T	F	F	T	T	P1101
23	F	F	F	T	F	T	F	F	P1101
24	F	F	F	T	F	T	F	T	P1101
25	F	F	F	T	F	T	T	F	P1101
26	F	F	F	T	F	T	T	T	P1101
27	F	F	F	T	T	F	F	F	P1101
28	F	F	F	T	T	F	F	T	P1101
29	F	F	F	T	T	F	T	F	P1101
30	F	F	F	T	T	F	T	T	P1101
31	F	F	F	T	T	T	F	F	P1101

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

32	F	F	F	T	T	T	F	T	P1101
33	F	F	F	T	T	T	T	F	P1101
34	F	F	F	T	T	T	T	T	P1101
35	F	F	T	F	F	F	F	F	No DTC
36	F	F	T	F	F	F	F	T	No DTC
37	F	F	T	F	F	F	T	F	P1101
38	F	F	T	F	F	F	T	T	P1101
39	F	F	T	F	F	T	F	F	P1101
40	F	F	T	F	F	T	F	T	P1101
41	F	F	T	F	F	T	T	F	P1101
42	F	F	T	F	F	T	T	T	P1101
43	F	F	T	F	T	F	F	F	P1101
44	F	F	T	F	T	F	F	T	P1101
45	F	F	T	F	T	F	T	F	P1101
46	F	F	T	F	T	F	T	T	P1101
47	F	F	T	F	T	T	F	F	P1101
48	F	F	T	F	T	T	F	T	P1101
49	F	F	T	F	T	T	T	F	P1101
50	F	F	T	F	T	T	T	T	P1101
51	F	F	T	T	F	F	F	F	P1101
52	F	F	T	T	F	F	F	T	P1101
53	F	F	T	T	F	F	T	F	P1101
54	F	F	T	T	F	F	T	T	P1101
55	F	F	T	T	F	T	F	F	P1101
56	F	F	T	T	F	T	F	T	P1101
57	F	F	T	T	F	T	T	F	P1101
58	F	F	T	T	F	T	T	T	P1101
59	F	F	T	T	T	F	F	F	No DTC
60	F	F	T	T	T	F	F	T	No DTC
61	F	F	T	T	T	F	T	F	No DTC
62	F	F	T	T	T	F	T	T	No DTC
63	F	F	T	T	T	T	F	F	P1101
64	F	F	T	T	T	T	F	T	P1101
65	F	F	T	T	T	T	T	F	P1101
66	F	F	T	T	T	T	T	T	P1101
67	F	T	F	F	F	F	F	F	No DTC
68	F	T	F	F	F	F	F	T	No DTC
69	F	T	F	F	F	F	T	F	P1101

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

70	F	T	F	F	F	F	T	T	P0236
71	F	T	F	F	F	T	F	F	P1101
72	F	T	F	F	F	T	F	T	P0121
73	F	T	F	F	F	T	T	F	P1101
74	F	T	F	F	F	T	T	T	P0236
75	F	T	F	F	T	F	F	F	P1101
76	F	T	F	F	T	F	F	T	P1101
77	F	T	F	F	T	F	T	F	P1101
78	F	T	F	F	T	F	T	T	P0236
79	F	T	F	F	T	T	F	F	P1101
80	F	T	F	F	T	T	F	T	P0121
81	F	T	F	F	T	T	T	F	P1101
82	F	T	F	F	T	T	T	T	P0236
83	F	T	F	T	F	F	F	F	P1101
84	F	T	F	T	F	F	F	T	P1101
85	F	T	F	T	F	F	T	F	P1101
86	F	T	F	T	F	F	T	T	P1101
87	F	T	F	T	F	T	F	F	P1101
88	F	T	F	T	F	T	F	T	P1101
89	F	T	F	T	F	T	T	F	P1101
90	F	T	F	T	F	T	T	T	P1101
91	F	T	F	T	T	F	F	F	P1101
92	F	T	F	T	T	F	F	T	P1101
93	F	T	F	T	T	F	T	F	P1101
94	F	T	F	T	T	F	T	T	P1101
95	F	T	F	T	T	T	F	F	P1101
96	F	T	F	T	T	T	F	T	P1101
97	F	T	F	T	T	T	T	F	P1101
98	F	T	F	T	T	T	T	T	P1101
99	F	T	T	F	F	F	F	F	P1101
100	F	T	T	F	F	F	F	T	P1101
101	F	T	T	F	F	F	T	F	P1101
102	F	T	T	F	F	F	T	T	P1101
103	F	T	T	F	F	T	F	F	P1101
104	F	T	T	F	F	T	F	T	P1101
105	F	T	T	F	F	T	T	F	P1101
106	F	T	T	F	F	T	T	T	P1101
107	F	T	T	F	T	F	F	F	P1101

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

108	F	T	T	F	T	F	F	T	P1101
109	F	T	T	F	T	F	T	F	P1101
110	F	T	T	F	T	F	T	T	P1101
111	F	T	T	F	T	T	F	F	P1101
112	F	T	T	F	T	T	F	T	P1101
113	F	T	T	F	T	T	T	F	P1101
114	F	T	T	F	T	T	T	T	P1101
115	F	T	T	T	F	F	F	F	P0106
116	F	T	T	T	F	F	F	T	P0106
117	F	T	T	T	F	F	T	F	P0106
118	F	T	T	T	F	F	T	T	P0106
119	F	T	T	T	F	T	F	F	P1101
120	F	T	T	T	F	T	F	T	P1101
121	F	T	T	T	F	T	T	F	P1101
122	F	T	T	T	F	T	T	T	P1101
123	F	T	T	T	T	F	F	F	P1101
124	F	T	T	T	T	F	F	T	P1101
125	F	T	T	T	T	F	T	F	P1101
126	F	T	T	T	T	F	T	T	P1101
127	F	T	T	T	T	T	F	F	P1101
128	F	T	T	T	T	T	F	T	P1101
129	F	T	T	T	T	T	T	F	P1101
130	F	T	T	T	T	T	T	T	P1101
131	T	F	F	F	F	F	F	F	No DTC
132	T	F	F	F	F	F	F	T	No DTC
133	T	F	F	F	F	F	T	F	P1101
134	T	F	F	F	F	F	T	T	P0236
135	T	F	F	F	F	T	F	F	P1101
136	T	F	F	F	F	T	F	T	P0121
137	T	F	F	F	F	T	T	F	P1101
138	T	F	F	F	F	T	T	T	P0236
139	T	F	F	F	T	F	F	F	P1101
140	T	F	F	F	T	F	F	T	P1101
141	T	F	F	F	T	F	T	F	P1101
142	T	F	F	F	T	F	T	T	P0236
143	T	F	F	F	T	T	F	F	P1101
144	T	F	F	F	T	T	F	T	P0121
145	T	F	F	F	T	T	T	F	P1101

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

146	T	F	F	F	T	T	T	T	P0236
147	T	F	F	T	F	F	F	F	P1101
148	T	F	F	T	F	F	F	T	P1101
149	T	F	F	T	F	F	T	F	P1101
150	T	F	F	T	F	F	T	T	P1101
151	T	F	F	T	F	T	F	F	P1101
152	T	F	F	T	F	T	F	T	P1101
153	T	F	F	T	F	T	T	F	P1101
154	T	F	F	T	F	T	T	T	P1101
155	T	F	F	T	T	F	F	F	P1101
156	T	F	F	T	T	F	F	T	P1101
157	T	F	F	T	T	F	T	F	P1101
158	T	F	F	T	T	F	T	T	P1101
159	T	F	F	T	T	T	F	F	P1101
160	T	F	F	T	T	T	F	T	P1101
161	T	F	F	T	T	T	T	F	P1101
162	T	F	F	T	T	T	T	T	P1101
163	T	F	T	F	F	F	F	F	P1101
164	T	F	T	F	F	F	F	T	P1101
165	T	F	T	F	F	F	T	F	P1101
166	T	F	T	F	F	F	T	T	P1101
167	T	F	T	F	F	T	F	F	P1101
168	T	F	T	F	F	T	F	T	P1101
169	T	F	T	F	F	T	T	F	P1101
170	T	F	T	F	F	T	T	T	P1101
171	T	F	T	F	T	F	F	F	P1101
172	T	F	T	F	T	F	F	T	P1101
173	T	F	T	F	T	F	T	F	P1101
174	T	F	T	F	T	F	T	T	P1101
175	T	F	T	F	T	T	F	F	P1101
176	T	F	T	F	T	T	F	T	P1101
177	T	F	T	F	T	T	T	F	P1101
178	T	F	T	F	T	T	T	T	P1101
179	T	F	T	T	F	F	F	F	P1101
180	T	F	T	T	F	F	F	T	P1101
181	T	F	T	T	F	F	T	F	P1101
182	T	F	T	T	F	F	T	T	P1101
183	T	F	T	T	F	T	F	F	P1101

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

184	T	F	T	T	F	T	F	T	P1101
185	T	F	T	T	F	T	T	F	P1101
186	T	F	T	T	F	T	T	T	P1101
187	T	F	T	T	T	F	F	F	P0101 or P010B
188	T	F	T	T	T	F	F	T	P0101 or P010B
189	T	F	T	T	T	F	T	F	P0101 or P010B
190	T	F	T	T	T	F	T	T	P0101 or P010B
191	T	F	T	T	T	T	F	F	P1101
192	T	F	T	T	T	T	F	T	P1101
193	T	F	T	T	T	T	T	F	P1101
194	T	F	T	T	T	T	T	T	P1101
195	T	T	F	F	F	F	F	F	P1101
196	T	T	F	F	F	F	F	T	P1101
197	T	T	F	F	F	F	T	F	P1101
198	T	T	F	F	F	F	T	T	P0236
199	T	T	F	F	F	T	F	F	P1101
200	T	T	F	F	F	T	F	T	P0121
201	T	T	F	F	F	T	T	F	P1101
202	T	T	F	F	F	T	T	T	P0236
203	T	T	F	F	T	F	F	F	P1101
204	T	T	F	F	T	F	F	T	P1101
205	T	T	F	F	T	F	T	F	P1101
206	T	T	F	F	T	F	T	T	P0236
207	T	T	F	F	T	T	F	F	P1101
208	T	T	F	F	T	T	F	T	P0121
209	T	T	F	F	T	T	T	F	P1101
210	T	T	F	F	T	T	T	T	P0236
211	T	T	F	T	F	F	F	F	P1101
212	T	T	F	T	F	F	F	T	P1101
213	T	T	F	T	F	F	T	F	P1101
214	T	T	F	T	F	F	T	T	P1101
215	T	T	F	T	F	T	F	F	P1101
216	T	T	F	T	F	T	F	T	P1101
217	T	T	F	T	F	T	T	F	P1101
218	T	T	F	T	F	T	T	T	P1101
219	T	T	F	T	T	F	F	F	P1101
220	T	T	F	T	T	F	F	T	P1101
221	T	T	F	T	T	F	T	F	P1101

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

222	T	T	F	T	T	F	T	T	P1101
223	T	T	F	T	T	T	F	F	P1101
224	T	T	F	T	T	T	F	T	P1101
225	T	T	F	T	T	T	T	F	P1101
226	T	T	F	T	T	T	T	T	P1101
227	T	T	T	F	F	F	F	F	P1101
228	T	T	T	F	F	F	F	T	P1101
229	T	T	T	F	F	F	T	F	P1101
230	T	T	T	F	F	F	T	T	P1101
231	T	T	T	F	F	T	F	F	P1101
232	T	T	T	F	F	T	F	T	P1101
233	T	T	T	F	F	T	T	F	P1101
234	T	T	T	F	F	T	T	T	P1101
235	T	T	T	F	T	F	F	F	P1101
236	T	T	T	F	T	F	F	T	P1101
237	T	T	T	F	T	F	T	F	P1101
238	T	T	T	F	T	F	T	T	P1101
239	T	T	T	F	T	T	F	F	P1101
240	T	T	T	F	T	T	F	T	P1101
241	T	T	T	F	T	T	T	F	P1101
242	T	T	T	F	T	T	T	T	P1101
243	T	T	T	T	F	F	F	F	P1101
244	T	T	T	T	F	F	F	T	P1101
245	T	T	T	T	F	F	T	F	P1101
246	T	T	T	T	F	F	T	T	P1101
247	T	T	T	T	F	T	F	F	P1101
248	T	T	T	T	F	T	F	T	P1101
249	T	T	T	T	F	T	T	F	P1101
250	T	T	T	T	F	T	T	T	P1101
251	T	T	T	T	T	F	F	F	P1101
252	T	T	T	T	T	F	F	T	P1101
253	T	T	T	T	T	F	T	F	P1101
254	T	T	T	T	T	F	T	T	P1101
255	T	T	T	T	T	T	F	F	P1101
256	T	T	T	T	T	T	F	T	P1101
257	T	T	T	T	T	T	T	F	P1101
258	T	T	T	T	T	T	T	T	P1101

Initial Supporting table - P050D_P1400_CatalystLightOffExtendedEngineRunTimeExit

Description: Exit Catalyst Warm-up mode if Engine Run Time is greater than this value. This table is based on percent ethanol (x-axis) and catmon's NormRatio_EWMA value (y-axis). The NormRatio_EWMA value determines the state of the catalyst. Typically, NormRatio_EWMA values below 0.35 (0 is bad and 1 is good) represent catalysts that have degraded. The emission performance of these degraded catalysts can be improved by extending catalyst light off of GetE85R_Pct_FFS_CompAtEngFloat.

y/x	0	25	50	75	100
0.000	35	35	35	35	35
0.125	35	35	35	35	35
0.250	35	35	35	35	35
0.375	35	35	35	35	35
0.500	35	35	35	35	35
0.625	35	35	35	35	35
0.750	35	35	35	35	35
0.875	35	35	35	35	35
1.000	35	35	35	35	35

Initial Supporting table - 1st_Fire Aftr Misfr_Ace I

Description: Used for P0300 - P0308, Multiplier for establishing the expected acceleration of the cylinder after the misfire

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	1,000	1,100	1,200	1,400	1,500	1,600	1,800	2,000	2,200	2,400	2,600	3,000	4,000	4,500	5,000	5,500	6,000
2	0.88	0.52	0.37	1.13	0.55	0.44	0.81	0.78	0.77	0.60	0.69	0.62	0.44	0.70	0.80	0.80	0.55
6	1.51	0.88	0.66	1.48	1.42	1.03	1.12	1.01	1.02	0.81	0.94	1.13	0.81	1.09	1.11	1.06	0.67
10	1.58	1.31	1.12	1.92	1.88	1.17	1.37	0.92	1.13	0.99	1.54	1.77	1.79	1.94	1.50	1.19	0.88
14	1.70	1.84	1.40	1.73	1.81	1.10	1.46	1.18	1.35	1.03	1.33	1.82	2.29	2.06	1.88	1.44	1.00
18	1.97	2.23	1.62	1.73	1.77	1.27	1.63	1.55	1.52	1.01	1.24	1.62	2.21	2.10	2.19	1.59	1.19
22	2.19	2.52	1.80	1.73	1.81	1.38	1.70	1.80	1.69	0.98	1.20	1.55	2.03	2.08	2.22	1.58	1.31
30	2.53	2.94	1.96	1.72	1.79	1.50	1.86	2.03	1.92	1.02	1.16	1.45	1.73	2.13	2.00	1.61	1.25
40	2.82	3.29	2.09	1.72	1.78	1.60	2.06	2.31	2.10	1.05	1.17	1.38	1.62	1.86	1.82	1.53	1.11
85	3.46	3.96	2.29	1.72	1.81	1.98	2.45	2.88	2.46	1.12	1.21	1.40	1.48	1.58	1.69	1.46	1.02

Initial Supporting table - 1st_FireAftrMisfr_Jerk

Description: Used for P0300 - P0308, Multiplier for establishing the expected Jerk of the cylinder after the misfire

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	1,000	1,100	1,200	1,400	1,500	1,600	1,800	2,000	2,200	2,400	2,600	3,000	4,000	4,500	5,000	5,500	6,000
2	-0.98	-0.97	-0.92	-0.65	-0.63	-0.51	-0.53	-0.61	-0.67	-0.63	-0.45	-0.47	-0.33	-0.42	-0.40	-0.82	-0.50
6	-1.06	-0.97	-1.14	-0.79	-1.11	-1.03	-0.93	-1.18	-0.88	-0.98	-0.84	-0.83	-0.62	-0.81	-0.72	-1.08	-0.60
10	-0.89	-0.82	-1.07	-0.68	-1.00	-0.91	-0.78	-0.94	-0.85	-0.92	-0.91	-0.88	-0.94	-1.04	-0.82	-0.89	-0.81
14	-0.96	-0.72	-0.96	-0.71	-0.97	-0.92	-0.81	-0.90	-0.85	-0.89	-0.88	-0.93	-1.07	-0.91	-0.86	-0.79	-0.89
18	-0.90	-0.67	-0.88	-0.73	-0.95	-0.91	-0.81	-0.86	-0.84	-0.86	-0.87	-0.95	-1.09	-0.84	-0.91	-0.83	-0.80
22	-0.83	-0.64	-0.84	-0.71	-0.94	-0.91	-0.81	-0.83	-0.82	-0.85	-0.86	-0.96	-1.06	-0.80	-1.00	-0.83	-0.80
30	-0.74	-0.60	-0.81	-0.77	-0.93	-0.90	-0.80	-0.80	-0.81	-0.83	-0.85	-0.96	-0.98	-0.71	-1.00	-0.81	-0.78
40	-0.68	-0.57	-0.80	-0.79	-0.92	-0.89	-0.80	-0.78	-0.80	-0.83	-0.87	-0.97	-0.94	-0.69	-0.99	-0.82	-0.78
85	-0.59	-0.53	-0.73	-0.80	-0.92	-0.88	-0.80	-0.75	-0.80	-0.83	-0.90	-0.93	-0.87	-0.66	-1.21	-0.83	-0.75

Initial Supporting table - IstFireAfterMisJerkAFM

Description: Used for P0300 - P0308, Multiplier for establishing the expected jerk of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	1	0	0	0	0	0	0	1	1
8	1	-1	-1	-1	0	0	0	0	1
12	1	-1	-1	-1	-1	-1	-1	0	0
16	1	-1	-1	-1	-1	-1	-1	0	0
20	1	-1	-1	-1	-1	-1	-1	-1	0
24	1	-1	-1	-1	-1	-1	-1	-1	-1
26	1	-1	-1	-1	-1	-1	-1	-1	-1
30	1	-1	-1	-1	-1	-1	-1	-1	-1
60	1	-1	-1	-1	-1	-1	-1	-1	-1

Initial Supporting table - IstFireAftrMisAcelAFM

Description: Used for P0300 - P0308, Multiplier for establishing the expected acceleration of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	1	1	1	1	1	1	1	1	1
8	1	0	0	0	0	0	0	0	0
12	1	0	0	0	0	0	0	0	0
16	1	0	0	0	0	0	0	0	0
20	1	-1	-1	-1	-1	-1	-1	0	0
24	1	-1	-1	-1	-1	-1	-1	-1	0
26	1	-1	-1	-1	-1	-1	-1	-1	0
30	1	-1	-1	-1	-1	-1	-1	-1	0
60	1	-1	-1	-1	-1	-1	-1	-1	-1

Initial Supporting table - Abnormal Cyl Mode

Description: Used for P0300-P0308. Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (Cylinder Mode Equation)

Value Units: Number of consecutive number of decelerating cylinders (integer)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	4	4	3	3	3	3	3	3	3

Initial Supporting table - Abnormal Rev Mode

Description: Used for P0300-P0308. Abnormal Rev Mode Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (Rev Mode Equation)

Value Units: Number of consecutive number of decelerating cylinders (integer)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Initial Supporting table - Abnormal SCD Mode

Description: Used for P0300-P0308. Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (SCD Mode Equation)

Value Units: Number of consecutive number of decelerating cylinders (integer)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	2	2	2	2	2	2	2	2	2

Initial Supporting table ■Bank_SCD_Decel

Description: Used for P0300 - P0308, Mulitplier to SCD decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,200	1,400	1,600
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - Bank_SCD_Jerk

Description: Used for P0300 - P0308, Mulitplier to Medres SCD jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: mulitplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,200	1,400	1,600
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - BankCylModeDecel

Description: Used for P0300 - P0308, Mulitplier to Lores Decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	600	750	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	3,000	4,000	4,500	5,000	5,500	6,000
2	5.50	6.00	7.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
8	5.00	5.50	7.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
12	4.50	5.00	7.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
16	4.00	4.50	7.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
20	3.50	4.00	6.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
24	3.00	3.50	5.00	7.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
30	2.50	3.00	4.00	6.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
40	2.00	2.50	3.50	4.50	8.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
60	1.50	1.50	2.00	3.50	5.00	9.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00

Initial Supporting table - BankCylModeJerk

Description: Used for P0300 - P0308, Mulitplier to Lores Jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	600	750	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	3,000	4,000	4,500	5,000	5,500	6,000
2	5.50	6.00	7.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
8	5.00	5.50	7.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
12	4.50	5.00	7.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
16	4.00	4.50	7.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
20	3.50	4.00	6.00	8.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
24	3.00	3.50	5.00	7.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
30	2.50	3.00	4.00	6.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
40	2.00	2.50	3.50	4.50	8.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
60	1.50	1.50	2.00	3.50	5.00	9.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00

Initial Supporting table - Catalyst_Damage_Misfire_Percentage

Description: Catalyst Damaging Misfire Percentage" Table whenever secondary conditions are met.

Value Units: percent misfire over 200 revolutions (%)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000
0	44.9	44.9	22.4	22.4	17.9	11.1	5.5	5.5
10	44.9	44.9	22.4	22.4	17.9	11.1	5.5	5.5
20	22.4	29.6	22.4	22.4	17.9	11.1	5.5	5.5
30	22.4	22.4	22.4	22.4	11.1	11.1	5.5	5.5
40	22.4	22.4	22.4	11.1	11.1	7.4	4.6	4.6
50	17.9	17.9	11.1	11.1	7.4	5.5	4.6	4.6
60	17.9	11.1	11.1	7.4	7.4	4.6	4.6	4.6
70	11.1	11.1	7.4	5.5	5.5	4.6	4.6	4.6
80	11.1	11.1	7.4	5.5	5.5	4.6	4.6	4.6
90	11.1	11.1	7.4	5.5	5.5	4.6	4.6	4.6
100	11.1	11.1	7.4	5.5	5.5	4.6	4.6	4.6

Initial Supporting table - ClyAfterAFM_Decel

Description: Used for P0300 - P0308, Mulitplier to Lores decel to account for different patterni of misfire after a deactivated cylider. Similar to the second cylinder of consecutive cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	0.70	0.73	0.76	0.96	0.95	1.05	1.16	0.86	0.75
8	0.69	0.45	0.52	0.69	0.70	0.77	0.77	0.55	0.38
12	0.89	0.33	0.40	0.48	0.52	0.56	0.49	0.30	-0.03
16	1.10	0.29	0.34	0.36	0.39	0.39	0.30	0.09	-0.25
20	1.25	0.30	0.33	0.33	0.35	0.33	0.24	0.04	-0.33
24	1.25	0.29	0.35	0.35	0.39	0.38	0.30	0.10	-0.21
26	1.27	0.29	0.34	0.36	0.39	0.40	0.32	0.15	-0.13
30	1.26	0.29	0.31	0.35	0.37	0.43	0.36	0.25	0.02
60	1.15	0.26	0.25	0.29	0.29	0.31	0.34	0.36	0.29

Initial Supporting table - CylBeforeAFM_Jerk

Description: Used for P0300 - P0308, Mulitplier to Lores decel to account for different pattern of misfire before a deactivated cylider, but after an active cylinder that follows an deactive cylinder on engine that supports cylinder deactivation in non even fire patterns.. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	3.75	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
8	3.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
12	2.00	15.00	10.00	15.00	15.00	15.00	15.00	15.00	15.00
16	1.50	8.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
20	1.50	7.50	15.00	15.00	15.00	15.00	15.00	15.00	15.00
24	1.50	6.25	11.00	15.00	15.00	15.00	15.00	15.00	15.00
26	1.50	4.25	8.00	15.00	15.00	15.00	15.00	15.00	15.00
30	1.50	3.00	4.50	15.00	15.00	15.00	15.00	15.00	15.00
60	1.50	2.00	3.00	8.00	15.00	15.00	15.00	15.00	15.00

Initial Supporting table - CombustModeIdleTbl

Description: Used for P0300 - P0308, Only used on Diesel engines. Combustion modes that will force use of Idle table. A value of CeCMBR_i_CombModesMax means not selected.

Value Units: Enumerated value of different combustion modes (enumeration)
X Unit: Current Combustion Mode (enumeration)

CombustModeIdleTbl - Part 1						
y/x	0	1	2	3	4	5
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax

CombustModeIdleTbl - Part 2						
y/x	6	7	8	9	10	11
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax

CombustModeIdleTbl - Part 3						
y/x	12	13	14	15	16	
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	

Initial Supporting table - (ConsecCylModDecel

Description: Used for P0300 - P0308, Mulitplier to Lores decel to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	600	750	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	3,000	4,000	4,500	5,000	5,500	6,000
4	2.25	1.82	1.72	1.64	1.53	1.76	1.02	1.23	1.17	1.09	1.00	1.02	1.06	1.28	1.36	1.56	1.26
6	2.50	2.00	1.88	1.60	1.74	1.69	1.28	1.32	1.18	1.14	1.04	1.15	1.00	1.00	1.32	1.63	1.22
10	1.99	2.51	1.59	1.14	1.50	1.41	1.15	1.37	0.86	0.76	1.34	1.13	0.95	0.88	1.19	1.50	1.25
14	1.71	2.21	1.51	1.30	1.38	1.11	0.96	0.99	0.68	0.79	1.12	0.98	0.81	1.06	1.06	1.50	1.19
18	1.57	1.97	1.47	1.39	1.29	1.10	0.91	0.95	0.74	0.81	1.08	0.99	1.00	1.19	1.19	1.47	1.25
22	1.48	1.79	1.49	1.41	1.31	1.08	0.90	0.91	0.77	0.83	0.94	1.11	1.05	1.42	1.44	1.58	1.44
30	1.35	1.57	1.52	1.43	1.30	1.07	0.90	0.90	0.79	0.85	0.83	1.05	1.03	1.70	1.72	1.70	1.60
40	1.25	1.42	1.54	1.45	1.29	1.06	0.90	0.94	0.84	0.87	0.74	0.98	1.05	1.67	1.68	1.50	1.43
85	1.09	1.16	1.60	1.49	1.27	1.04	0.99	1.00	0.94	0.92	0.73	0.82	1.09	1.68	1.66	1.17	1.07

Initial Supporting table - ConsecCylModeJerk

Description: Used for P0300 - P0308, Mulitplier to Lores Jerk to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	600	750	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	3,000	4,000	4,500	5,000	5,500	6,000
4	-1	-1	0	-1	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
6	-1	-1	0	-1	-3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
10	-1	-1	0	-1	-3	-1	-1	-1	-1	-1	-1	-1	-2	-1	-1	-1	-1
14	0	0	0	0	-2	-1	-1	-1	-1	-1	-1	-2	-1	-1	-1	-1	-1
18	0	0	0	0	-2	-1	-1	-1	0	-1	-1	-2	-1	-1	-1	-1	-1
22	0	0	0	0	-2	-1	-1	0	0	-1	-1	-2	-1	-1	-1	-1	-1
30	0	0	0	0	-2	-1	-1	0	0	0	-1	-2	-1	0	-1	-1	-1
40	0	0	0	0	-2	-1	-1	0	0	0	-1	-2	-1	0	-1	-1	-1
85	0	0	0	0	0	-1	0	0	0	0	-1	-2	0	0	-1	-1	-1

Initial Supporting table - ConsecSCD_Decel

Description: Used for P0300 - P0308, Mulitplier to medres decel to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table ■ConsecSCD_Jerk

Description: Used for P0300 - P0308, Mulitplier to medres Jerk to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - CylAfterAFM Jerk

Description: Used for P0300 - P0308, Mulitplier to Lores Jerk to account for different pattern of misfire after a deactivated cylider. Similar to the second cylinder of consecutive cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	1	0	0	0	0	0	0	0	0
8	1	0	0	0	0	0	0	0	0
12	1	0	0	0	0	0	0	0	0
16	1	-1	-1	0	0	0	0	0	0
20	1	-1	0	0	0	0	0	0	0
24	1	0	-1	0	0	0	0	0	0
26	1	0	-1	0	0	0	0	0	0
30	1	0	0	0	0	0	0	0	0
60	1	0	0	0	0	0	0	0	0

Initial Supporting table - CylBeforeAFM_Decel

Description: Used for P0300 - P0308, Mulitplier to Lores decel to account for different pattern of misfire before a deactivated cylider, but after an active cylinder that follows an deactive cylinder on engine that supports cylinder deactivation in non even fire patterns.. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	5.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
8	4.50	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
12	3.50	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
16	3.00	11.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
20	2.50	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
24	2.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
26	1.88	13.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
30	1.76	9.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
60	1.50	4.00	6.50	15.00	15.00	15.00	15.00	15.00	15.00

Initial Supporting table - CylModeDecel

Description: Used for P0300-P0308. Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

CylModeDecel - Part 1

y/x	600	750	800	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
2	2,276	1,483	1,150	965	907	600	501	294	240	188	252	207	122
4	1,990	1,351	918	976	757	475	344	250	215	181	156	160	107
6	1,730	1,170	635	801	666	449	335	213	190	175	114	111	92
8	2,000	1,050	548	697	694	514	379	225	187	173	104	102	81
10	2,276	950	685	819	805	674	490	278	222	198	137	130	87
12	2,581	1,058	827	943	905	791	531	320	265	245	170	157	108
14	2,886	1,218	961	1,040	1,008	855	574	368	310	285	203	185	129
16	3,191	1,357	1,083	1,137	1,085	905	618	408	343	318	236	213	151
18	3,496	1,513	1,205	1,234	1,163	954	662	444	377	352	269	241	172
20	3,801	1,669	1,327	1,331	1,219	1,004	706	474	410	385	292	268	195
22	4,106	1,824	1,449	1,428	1,274	1,054	750	515	444	418	323	297	218
24	4,411	1,980	1,571	1,525	1,330	1,103	794	556	477	451	354	321	248
26	4,716	2,136	1,693	1,622	1,386	1,153	838	597	511	484	385	352	264
30	5,327	2,447	1,937	1,816	1,498	1,252	926	680	578	551	448	409	297
40	6,852	3,226	2,547	2,301	1,777	1,500	1,146	886	746	717	603	546	380
60	9,903	4,784	3,768	3,271	2,336	1,997	1,585	1,298	1,081	1,049	914	770	545
85	13,716	6,731	5,293	4,483	3,043	2,617	2,134	1,813	1,501	1,464	1,303	1,050	751

CylModeDecel - Part 2

y/x	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500
2	97	75	57	54	47	38	30	22	15	13	10	11	10
4	82	65	51	47	41	32	25	18	13	11	9	10	9
6	75	55	45	41	34	26	21	14	11	10	8	9	8
8	77	57	44	33	31	23	16	11	10	9	8	9	8
10	91	68	48	33	29	24	14	10	8	8	8	8	8
12	99	73	52	41	33	27	15	10	8	8	8	8	8
14	114	84	62	49	39	30	18	11	9	8	8	8	8
16	128	95	71	56	44	35	21	12	10	8	9	8	8
18	142	106	80	64	50	40	23	14	11	8	9	8	8
20	156	117	90	71	55	45	26	16	11	9	9	8	8
22	171	127	99	78	61	50	29	19	12	9	10	8	8

Initial Supporting table - CylModeDecel

24	191	139	107	86	66	55	32	21	13	10	10	8	9
26	210	149	114	93	72	60	35	23	14	11	11	9	9
30	236	169	129	106	83	69	41	30	15	13	12	10	10
40	300	220	165	135	109	94	56	42	22	17	15	14	12
60	429	322	238	193	157	138	80	65	34	25	22	20	17
85	591	449	328	266	217	190	110	97	49	35	30	27	23

Initial Supporting table - CylModeJerk

Description: Crankshaft jerk threshold. Thresholds are a function of rpm and % engine Load.

Value Units: Change in Delta time per cylinder from last cylinder (usee)
Y Units: percent load of max indicated torque (%)

CylModeJerk - Part 1

y/x	600	750	800	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
2	3,524	1,459	1,120	1,068	797	576	469	347	307	261	217	189	137
4	3,527	1,690	1,357	1,210	981	733	545	444	322	277	217	179	127
6	3,551	1,937	1,589	1,446	1,215	930	625	509	384	343	246	193	148
8	3,598	2,343	1,855	1,718	1,449	1,107	753	599	460	410	307	250	187
10	4,010	2,749	2,241	2,060	1,768	1,355	898	711	533	499	383	312	231
12	4,624	3,154	2,663	2,402	2,086	1,584	1,076	834	630	578	461	375	275
14	5,549	3,560	3,115	2,744	2,404	1,833	1,255	959	722	641	539	438	319
16	6,453	3,966	3,556	3,067	2,723	2,070	1,434	1,084	821	704	617	501	363
18	7,342	4,430	3,978	3,399	3,041	2,308	1,613	1,210	920	782	695	564	407
20	8,230	4,988	4,327	3,731	3,359	2,545	1,792	1,335	1,018	882	773	626	451
22	9,119	5,457	4,677	4,062	3,678	2,782	1,970	1,461	1,117	950	851	689	495
24	10,008	5,934	5,027	4,394	3,996	3,019	2,149	1,586	1,216	1,028	929	752	539
26	10,896	6,335	5,376	4,742	4,314	3,257	2,328	1,712	1,315	1,101	1,007	815	583
30	12,674	7,136	6,083	5,402	4,951	3,731	2,686	1,962	1,512	1,259	1,163	940	671
40	17,117	9,141	7,841	7,051	6,510	4,917	3,580	2,590	2,006	1,688	1,551	1,254	890
60	26,004	13,150	11,358	10,348	9,552	7,290	5,368	3,791	2,994	2,457	2,314	1,881	1,330
85	30,000	18,161	15,753	14,471	13,355	10,256	7,603	5,293	4,228	3,433	3,269	2,666	1,880

CylModeJerk - Part 2

y/x	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500
2	108	83	63	56	46	41	30	23	20	13	9	12	11
4	96	70	58	52	38	36	25	19	16	10	7	11	10
6	98	81	64	53	36	33	23	17	14	9	7	10	9
8	130	101	78	58	41	37	28	16	13	10	8	9	8
10	163	122	96	73	52	45	32	17	13	11	9	8	8
12	195	144	114	87	63	52	37	20	15	12	10	8	8
14	228	167	131	102	74	60	42	22	18	14	12	9	9
16	260	190	149	117	86	67	46	25	20	16	14	11	10
18	293	213	167	132	97	75	51	28	23	17	15	13	11
20	325	237	185	147	108	82	55	32	25	18	16	14	12
22	358	260	202	162	119	90	60	35	28	19	18	15	13

Initial Supporting table - CylModeJerk

24	391	283	220	177	130	97	65	39	31	21	19	16	14
26	423	306	238	195	141	105	69	43	34	23	21	18	16
30	488	352	272	222	164	120	78	52	40	26	24	21	18
40	651	468	357	287	212	156	102	72	53	35	31	28	24
60	976	699	525	419	306	239	146	114	78	47	44	40	36
85	1,383	987	735	583	431	343	201	165	109	64	64	60	51

Initial Supporting table - DeacCylInversionDecel

Description: Used for P0300 - P0308, Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong" If deactivated cylinders don't decelerate at least this amount then the crank signal is inverting. Function of speed and load.

Value Units: Delta time per cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1

Initial Supporting table - DeacCylInversionJerk

Description: Used for P0300 - P0308, Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong" If deactivated cylinders don't jerk at least this amount then the crank signal is inverting. Function of speed and load.

Value Units: Change in Delta time per cylinder from last cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1
16	2	2	2	2	2	2	2	2	1
20	2	2	3	3	3	3	3	2	1
24	2	2	3	3	4	3	3	2	2
26	2	2	3	3	3	3	3	2	2
30	2	2	2	3	3	3	3	2	2
60	2	2	2	2	2	2	2	2	2

Initial Supporting table - EngineOverSpeedLimit

Description: Engine OverSpeed Limit versus gear

Value Units: RPM
X Unit: Enumeration of transmission gear state (enumeration)

EngineOverSpeedLimit - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGr9
1	6,100	6,100	6,100	6,100	6,100	6,100	6,100

EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGr10	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	6,100	4,000	6,100	4,000	6,100	6,100	

Initial Supporting table - InfrequentRegen

Description: Used for P0300-P0308. Only used on Diesel engines. Initiates a misfire delay when the current combustion mode matchs a selection in the table. A value of CeCMBR_i_CombModesMax means not selected.

Value Units: Enumerated value of different combustion modes (enumeration)
X Unit: Current Combustion Mode (enumeration)

InfrequentRegen - Part 1						
y/x	0	1	2	3	4	5
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax
InfrequentRegen - Part 2						
y/x	6	7	8	9	10	11
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax
InfrequentRegen - Part 3						
y/x	12	13	14	15	16	
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	

Initial Supporting table - Number of Normals

Description: Used for P0300-P0308. Number of Normals for the Driveline Ring Filter
After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.

Value Units: Number of Engine cycles after isolated misfire (Engine cycles)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	2	2	2	3	3	3	3	3	3

Initial Supporting table - P00C6 - High Pressure Pump Control Mode timeout

Description: High Pressure Pump Control Mode timeout

Value Units: Time (Seconds)
X Unit: Coolant Temperature (Deg C)

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	5.0	5.0	5.0	4.8	4.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Initial Supporting table - P00C6 - Max acceptable counts of fuel rail pressure after High Pressure Start

Description: The maximum acceptable counts of fuel rail pressure below KtFHPD_p_HPS_PressFallLoThrsh after High Pressure Start (HPS) is executed but before engine is in run mode.

Value Units: maximum acceptable counts of fuel rail pressure below KtFHPD_p_HPS_PressFallLoThrsh after High Pressure Start (Count)
X Unit: Coolant Temperature (Deg C)
Y Units: Ethanol Precent (%)

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
13	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
25	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
38	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
50	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
63	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
75	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
88	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
100	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Initial Supporting table - P00C6 - Minimum acceptable value of fuel rail pressure after High Pressure Start

Description: The minimum acceptable value of fuel rail pressure after High Pressure Start (HPS) is executed. This ensures the pressure does not fall off drastically after High Pressure Start (HPS) is executed, but before engine is in run mode.

Value Units: Minimum acceptable value of fuel rail pressure after High Pressure Start (Mpa)
X Unit: Coolant Temperature (Deg C)
Y Units: Ethanol Precent (%)

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
13	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
25	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
38	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
50	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
63	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
75	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
88	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
100	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Initial Supporting table - P00C6 - Minimum pressure in MPa that will exit High Pressure Start mode and allow fuel delivery

Description: This calibration is the minimum pressure in MPa that will exit High Pressure Start mode and allow fuel delivery

Value Units: Minimum pressure in MPa that will exit High Pressure Start mode and allow fuel delivery
X Unit: Coolant Temperature (Deg C)
Y Units: Ethanol Precent (%)

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
13	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
38	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
50	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
63	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
75	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
88	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
100	15.0	15.0	14.5	12.0	10.0	8.9	6.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Initial Supporting table - Pair_SCD_Decel

Description: Used for P0300 - P0308, Mulitplier to SCD_Decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting tablej - Pair_SCD_Jerk

Description: Used for P0300 - P0308, Mulitplier to P0300_SCD_Jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,200	1,400	1,600
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - PairCylModeDecel

Description: Used for P0300 - P0308, Mulitplier to Cyl Mode Deceleration to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: mulitplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	600	750	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	3,000	4,000	4,500	5,000	5,500	6,000
4	0.91	0.88	0.83	0.89	0.90	0.97	0.70	0.83	0.88	0.82	0.77	0.70	0.63	0.88	0.91	0.89	1.16
6	0.98	1.02	0.70	0.91	0.96	0.81	0.72	0.74	0.71	0.75	0.74	0.75	0.63	0.91	0.95	0.94	1.11
10	0.57	1.50	0.66	0.82	0.80	0.66	0.60	0.83	0.46	0.44	0.62	0.60	0.63	1.00	1.00	0.88	1.06
14	1.02	1.52	0.75	0.89	1.18	0.89	0.79	0.73	0.50	0.48	0.53	0.57	0.57	0.83	0.75	0.88	0.94
18	1.23	1.59	0.96	1.08	1.42	1.14	0.94	0.99	0.75	0.66	0.83	0.71	0.89	0.81	0.56	0.94	0.94
22	1.19	1.51	1.02	1.14	1.43	1.20	1.06	0.95	0.98	0.84	0.97	0.84	1.05	0.96	0.67	0.95	1.06
30	1.13	1.41	1.10	1.19	1.38	1.17	1.00	0.94	0.94	0.99	0.94	0.99	0.95	1.13	0.96	0.91	0.90
40	1.09	1.33	1.17	1.24	1.35	1.15	0.96	0.97	0.95	0.99	0.96	0.94	0.89	0.95	0.91	0.80	0.75
85	1.02	1.22	1.30	1.34	1.29	1.13	0.99	1.03	0.97	0.99	0.90	0.85	0.72	0.70	0.67	0.64	0.57

Initial Supporting table - PairCylModeJerk

Description: Used for P0300 - P0308, Mulitplier to P0300_CylModeJerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	600	750	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	3,000	4,000	4,500	5,000	5,500	6,000
4	0.90	1.16	0.98	1.02	0.94	1.23	1.20	1.44	1.34	1.24	1.18	1.06	1.16	1.32	2.00	2.69	1.50
6	0.70	0.96	0.75	0.79	0.79	0.90	0.87	1.02	1.09	0.90	0.93	0.94	1.06	1.26	1.78	2.23	1.45
10	0.54	0.78	0.64	0.70	0.73	0.65	0.56	0.58	0.66	0.56	0.62	0.54	1.00	1.23	1.41	1.61	1.81
14	0.63	0.76	0.71	0.73	0.83	0.78	0.73	0.65	0.82	0.70	0.63	0.64	0.80	0.94	1.11	1.21	1.56
18	0.69	0.75	0.70	0.79	0.87	0.84	0.83	0.74	0.96	0.88	0.77	0.72	0.82	0.89	1.03	1.14	1.24
22	0.68	0.71	0.70	0.79	0.85	0.86	0.89	0.82	0.99	1.00	0.90	0.78	0.94	0.89	1.05	1.03	1.07
30	0.59	0.71	0.63	0.72	0.84	0.90	0.91	0.93	0.97	0.98	0.93	0.86	1.05	0.81	0.98	0.94	0.93
40	0.53	0.69	0.59	0.67	0.84	0.91	0.87	0.90	0.93	0.94	0.94	0.92	1.01	0.81	0.93	0.80	0.76
85	0.54	0.65	0.53	0.59	0.85	0.90	0.81	0.85	0.87	0.89	0.80	0.78	0.73	0.63	0.78	0.57	0.48

Initial Supporting table - Random_SCD_Decel

Description: Used for P0300 - P0308, Mulitplier to SCD_Decel to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,200	1,400	1,600
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - Random_SCD_Jerk

Description: Used for P0300 - P0308, Mulitplier to Random_SCD_Jerk to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,200	1,400	1,600
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - RandomAFM_Decl

Description: Used for P0300 - P0308, Mulitplierto CylinderJDecel while in Cylnder Deactivation mode to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	0.70	0.85	0.88	0.67	0.48	0.53	0.57	0.55	0.39
8	0.69	0.97	0.92	0.64	0.46	0.47	0.55	0.53	0.36
12	0.89	1.03	0.99	0.67	0.51	0.55	0.59	0.65	0.59
16	1.10	1.00	1.01	0.73	0.66	0.74	0.84	0.89	0.91
20	1.25	0.96	0.95	0.81	0.92	1.01	1.09	1.09	1.20
24	1.25	0.87	0.93	0.94	1.03	1.19	1.28	1.20	1.31
26	1.27	0.82	0.87	0.93	1.03	1.25	1.32	1.23	1.34
30	1.26	0.72	0.73	0.87	0.98	1.26	1.40	1.27	1.35
60	1.15	0.44	0.47	0.61	0.75	0.89	1.06	1.25	1.31

Initial Supporting table - RandomAFM_Jerk

Description: Used for P0300 - P0308, Mulitplierto Cylinder_Jerk while in Cylnder Deactivation mode to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	800	1,000	1,200	1,400	1,600	1,800	2,000	2,300	2,600
2	-0.01	-0.07	-0.16	-0.06	0.04	0.12	0.27	0.54	0.97
8	-0.17	-0.33	-0.29	-0.25	-0.13	-0.10	-0.11	-0.07	0.05
12	-0.27	-0.47	-0.44	-0.35	-0.24	-0.23	-0.19	-0.24	-0.13
16	-0.33	-0.53	-0.50	-0.40	-0.30	-0.26	-0.22	-0.19	-0.06
20	-0.30	-0.52	-0.49	-0.42	-0.30	-0.21	-0.15	-0.07	0.07
24	-0.26	-0.48	-0.52	-0.45	-0.28	-0.21	-0.11	-0.02	0.14
26	-0.25	-0.46	-0.50	-0.43	-0.27	-0.21	-0.10	-0.01	0.14
30	-0.23	-0.40	-0.43	-0.38	-0.22	-0.16	-0.08	0.04	0.18
60	-0.15	-0.25	-0.25	-0.22	-0.11	-0.07	0.00	0.19	0.33

Initial Supporting table - RandomCylModDecel

Description: Used for P0300 - P0308. Multiplier to CylMode_Decel. account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: Multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	600	750	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	3,000	4,000	4,500	5,000	5,500	6,000
2	1.21	1.01	1.04	1.02	1.20	1.30	1.00	1.21	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.17	1.19	1.48	1.79	1.08	1.08	1.18	1.16	1.25	1.13	1.02	1.00	1.00	1.04	1.00	1.00	1.00
6	1.67	1.70	1.95	2.30	1.08	1.08	1.08	1.20	1.52	1.46	1.40	1.31	1.07	1.18	1.00	1.00	1.00
12	1.90	3.15	2.11	1.98	1.08	1.08	1.08	1.20	1.91	1.96	2.34	2.43	2.79	2.50	1.75	1.31	1.13
18	1.99	3.02	2.12	2.20	1.08	1.08	1.08	1.20	1.88	1.84	2.09	2.25	2.75	2.62	2.56	1.88	1.50
22	2.02	2.99	2.24	2.33	1.35	1.35	1.35	1.35	1.87	1.78	2.01	2.12	2.49	2.75	2.72	2.00	1.81
30	2.07	2.94	2.44	2.53	1.35	1.35	1.35	1.35	1.79	1.77	1.98	1.99	2.10	2.90	2.68	2.17	1.90
40	2.11	2.91	2.61	2.70	1.35	1.35	1.35	1.35	1.83	1.74	2.01	1.90	1.95	2.63	2.59	2.20	1.79
85	2.18	2.86	3.00	3.07	1.35	1.35	1.35	1.35	1.91	1.69	2.08	1.91	1.77	2.35	2.64	2.29	1.87

Initial Supporting table - RandomCylModJerk

Description: Used for P0300 - P0308, Multiplier to CylMode_Jerk to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	600	750	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,600	3,000	4,000	4,500	5,000	5,500	6,000
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - FandomRevModDecl

Description: Used for P0300 - P0308, Mulitplier to RevMode_Decel to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Value Units: multiplier
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	3,000	3,500	4,000	4,500	5,000	5,500	6,000	7,000	8,000
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - RepetSnapDecayAdjst

Description: Used for P0300 - P0308, If misfire is present in consecutive engine cycles, this multiplier is applied to the misfire jerk threshold and compared to a crankshaft snap value after the misfire has taken place.. Table lookup as a function of engine rpm.

Value Units: multiplier
X Unit: RPM

y/x	1,000	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000
1	2.72	2.19	6.83	9.66	3.32	2.29	1.33	1.08	1.08

Initial Supporting table - RevMode_Decel

Description: Used for P0300-P0308. Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time between revolutions (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
2	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
4	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
85	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - Ring Filter

Description: Used for P0300-P0308. Driveline Ring Filter
After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.

Value Units: Number of Engine cycles after isolated misfire (Engine cycles)
X Unit: thousands of RPM (rpm/1000)

y/x	0	1	2	3	4	5	6	7	8
1	4	4	4	4	4	4	4	4	4

Initial Supporting table - SCD_Decel

Description: Used for P0300-P0308 Crankshaft decel threshold. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
2	1,239	567	389	269	253	159	143	93	71	58	47	39	24
4	1,312	602	412	265	207	150	161	96	67	55	47	40	23
6	1,650	822	427	284	266	159	161	100	83	59	50	41	23
8	2,135	1,055	557	344	320	203	188	113	93	68	55	45	26
10	2,619	1,288	714	424	375	247	226	127	98	77	60	52	28
12	3,104	1,521	870	504	429	291	265	147	105	87	69	58	34
14	3,589	1,754	1,026	584	483	336	304	169	121	96	79	74	40
16	4,074	1,987	1,182	664	538	380	342	195	153	113	103	90	51
18	4,558	2,221	1,338	744	592	424	381	221	186	134	125	105	61
20	5,043	2,454	1,494	823	647	469	420	248	218	156	145	121	72
22	5,528	2,687	1,650	903	701	513	458	274	250	178	163	136	82
24	6,012	2,920	1,806	983	756	557	497	300	274	201	182	152	92
26	6,982	3,387	2,118	1,143	865	646	574	353	339	245	219	183	112
30	9,406	4,552	2,899	1,542	1,137	868	767	485	503	357	312	260	161
40	14,253	6,884	4,459	2,340	1,682	1,311	1,153	749	831	580	497	395	260
60	18,494	8,925	5,825	3,039	2,159	1,699	1,491	979	1,117	776	658	514	346
85	23,342	11,256	7,386	3,837	2,704	2,142	1,877	1,242	1,445	999	843	651	445

Initial Supporting table - SCD_Jerk

Description: Used for P0300-P0308. Crankshaft jerk threshold. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Value Units: Change in Delta time per cylinder from last cylinder (usee)
X Unit: RPM
Y Units: percent load of max indicated torque (%)

y/x	500	650	750	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
2	1,239	567	389	269	253	159	143	93	71	58	47	39	24
4	1,312	602	412	265	207	150	161	96	67	55	47	40	23
6	1,650	822	427	284	266	159	161	100	83	59	50	41	27
8	2,135	1,055	557	344	320	203	188	113	93	68	55	45	31
10	2,619	1,288	714	424	375	247	226	127	98	77	60	52	40
12	3,104	1,521	870	504	429	291	265	147	105	87	69	58	50
14	3,589	1,754	1,026	584	483	336	304	169	121	96	79	74	59
16	4,074	1,987	1,182	664	538	380	342	195	153	113	103	90	69
18	4,558	2,221	1,338	744	592	424	381	221	186	134	125	105	78
20	5,043	2,454	1,494	823	647	469	420	248	218	156	145	121	88
22	5,528	2,687	1,650	903	701	513	458	274	250	178	163	136	97
24	6,012	2,920	1,806	983	756	557	497	300	274	201	182	152	105
26	6,982	3,387	2,118	1,143	865	646	574	353	339	245	219	179	125
30	9,406	4,552	2,899	1,542	1,137	868	767	485	503	357	312	246	174
40	14,253	6,884	4,459	2,340	1,682	1,311	1,153	749	831	580	496	380	273
60	18,494	8,925	5,825	3,039	2,159	1,699	1,491	979	1,117	776	658	498	359
85	23,342	11,256	7,386	3,837	2,704	2,142	1,877	1,242	1,445	999	843	633	457

Initial Supporting table - SnapDecayAfterMisfire

Description: Used for P0300 - P0308, multiplier times the ddtjerk value used used to detect misfire at that speed and load to see if size of disturbance has died down as expected of real misfire. Table lookup as a function of engine rpm and trans gear ratio.

Value Units: multiplier
X Unit: RPM
Y Units: gear ratio

y/x	1,000	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000
1	1.34	1.64	2.04	1.75	1.75	1.75	1.75	1.75	1.75
1	1.48	1.83	1.21	1.39	1.04	1.04	1.04	1.04	1.04
1	1.49	1.68	1.00	1.28	1.00	1.72	1.72	1.72	1.72
1	1.50	1.41	1.00	1.12	1.00	1.50	1.50	1.50	1.50
2	1.51	1.41	1.00	1.00	1.00	1.50	1.50	1.50	1.06
3	1.15	1.42	1.00	1.00	1.00	1.50	1.50	1.44	1.24
3	0.75	1.42	1.00	1.00	0.94	0.95	1.42	1.48	1.30
5	0.75	0.75	1.25	1.75	1.23	0.81	1.31	1.30	1.49
6	0.75	0.75	1.25	1.75	1.23	0.81	1.31	1.30	1.49

Initial Supporting table - TOSSRoughRoadThres

Description: Used for P0300-P0308. Only used if Rough Road source = TOSS: dispersion value on Transmission Output Speed Sensor above which rough road is indicated present

Value Units: change in rpm per sec (rpm)
X Unit: Engine Speed (RPM)
Y Units: Transmission Speed (RPM)

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000
100	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
200	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
300	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
500	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
700	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
800	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
900	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,000	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,100	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,200	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,300	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Initial Supporting table - WaitToStart

Description: Used for P0300-P0308. Number of engine cycles to delay if diesel engine is cranked before wait to start lamp is extinguished. This lookup table determines the delay length by taking into account the coolant temperature.

Value Units: Number of Engine Cycles (integer)
X Unit: Engine Coolant (deg C)

y/x	-20	-10	0	10	20	30	40	50	60
1	0	0	0	0	0	0	0	0	0

Initial Supporting table - WSSRoughRoadThres

Description: Used for P0300-P0308. Only used if Wheel speed from ABS is used. If difference between wheel speed readings is larger than this limit, rough road is present

Value Units: acceleration
X Unit: Vehicle Speed (KPH)

y/x	0	12	24	36	48	60	72	85	97	109	121	133	145	157	169	181	193
1	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

Initial Supporting table - ZeroTorqueAFM

Description: Used for P0300-P0308. Zero torque engine load while in Active Fuel Management. %of Max Brake Torque along the Neutral rev line, as a function of RPM and Baro

Value Units: Percent of Maximum Brake torque (%)
X Unit: RPM
Y Units: Barometric Pressure (kPa)

ZeroTorqueAFM - Part 1

y/x	600	750	800	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
65	0.20	0.20	0.50	0.50	0.50	0.50	0.90	0.90	0.90	0.90	0.95	1.50	1.50
75	0.30	0.30	0.60	0.60	0.70	0.70	1.10	1.10	1.10	1.10	1.15	1.60	1.80
85	0.32	0.32	0.65	0.65	0.73	0.73	1.13	1.15	1.18	1.20	1.32	1.65	1.95
95	0.35	0.35	0.70	0.70	0.75	0.75	1.20	1.25	1.25	1.25	1.35	1.35	2.00
105	0.40	0.45	0.75	0.75	0.75	0.95	1.20	1.25	1.30	1.30	1.50	1.75	2.10

ZeroTorqueAFM - Part 2

y/x	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500
65	1.50	1.50	1.50	1.50	0.30	0.81	2.56	4.32	6.07	7.83	9.59	11.35	13.10
75	1.80	1.80	1.80	1.80	0.40	0.88	2.61	4.35	6.07	7.81	9.54	11.27	13.00
85	1.95	1.95	1.95	1.00	0.50	0.96	2.66	4.37	6.07	7.78	9.48	11.19	12.90
95	2.00	2.00	2.00	1.50	0.60	1.03	2.71	4.39	6.07	7.76	9.44	11.12	12.80
105	2.10	2.10	2.10	1.60	0.70	1.10	2.76	4.42	6.07	7.73	9.39	11.04	12.70

Initial Supporting table - ZeroTorqueEngLoad

Description: Used for P0300-P0308. %of Max Brake Torque that represents Zero Brake torque along the Neutral rev line, as a function of RPM and Baro

Value Units: Percent of Maximum Brake torque (%)
X Unit: RPM
Y Units: Barometric Pressure (kPa)

ZeroTorqueEngLoad - Part 1

y/x	600	750	800	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
65	-0.55	-1.10	-1.20	-1.30	-1.35	-1.45	-1.45	-1.45	-1.45	-1.40	-1.35	-1.30	-1.20
75	-0.35	-0.90	-1.00	-1.10	-1.15	-1.25	-1.25	-1.25	-1.25	-1.20	-1.15	-1.10	-1.00
85	-0.15	-0.70	-0.80	-0.90	-0.95	-1.05	-1.05	-1.05	-1.05	-1.00	-0.95	-0.90	-0.80
95	0.05	-0.50	-0.60	-0.70	-0.75	-0.85	-0.85	-0.85	-0.85	-0.80	-0.75	-0.70	-0.60
105	0.25	-0.30	-0.40	-0.50	-0.55	-0.65	-0.65	-0.65	-0.65	-0.60	-0.55	-0.50	-0.40

ZeroTorqueEngLoad - Part 2

y/x	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500
65	-1.10	-1.00	-0.90	-0.80	-0.70	-0.60	0.40	1.40	2.40	3.40	4.40	5.40	6.40
75	-0.90	-0.80	-0.70	-0.60	-0.50	-0.40	0.60	1.60	2.60	3.60	4.60	5.60	6.60
85	-0.70	-0.60	-0.50	-0.40	-0.30	-0.20	0.80	1.80	2.80	3.80	4.80	5.80	6.80
95	-0.50	-0.40	-0.30	-0.20	-0.10	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
105	-0.30	-0.20	-0.10	0.00	0.10	0.20	1.20	2.20	3.20	4.20	5.20	6.20	7.20

Initial Supporting table - P2B85 26CE Pump Speed Performance Initialization Delay

Description: Pump speed performance initialization delay as function of command speed and engine inlet coolant temperature

Value Units: Pump initialization delay (s)
X Unit: Engine inlet coolant temperature (Deg C)
Y Units: Commanded pump speed (RPM)

y/x	-40	0	40
1,000	3	3	3
4,000	3	3	3
6,250	4	4	4

Initial Supporting table - Expected shift time

Description: Determines expected shift times. Shift times that exceed this table will set either the Park Achievement Diagnostic, Reverse Achievement Diagnostic, Neutral Achievement Diagnostic, or the Drive Achievement Diagnostic.

Value Units: Seconds
X Unit: Target Range
Y Units: Starting Range

y/x	CeTRCR_RangeIndefined	CeTRCR_RangePark	CeTRCR_RangeReverse	CeTRCR_RangeNeutral	CeTRCR_RangeDrive
CeTRCR_RangeIndefined	1,800.0	1,800.0	1,800.0	1,800.0	1,800.0
CeTRCR_RangePark	10,000.0	1,800.0	10,000.0	10,000.0	10,000.0
CeTRCR_RangeReverse	10,000.0	10,000.0	8,000.0	3,600,000.0	3,600,000.0
CeTRCR_RangeNeutral	10,000.0	10,000.0	10,000.0	8,000.0	10,000.0
CeTRCR_RangeDrive	10,000.0	10,000.0	10,000.0	10,000.0	8,000.0

Initial Supporting table - P0101, P0106, P0121, P012B, P0236, P11011: MAF1 Residual Weight Factor based on RPM and MAF Est

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAF1 Residual Weight Factor based on RPM and MAF Est

Value Units: Weight Factor (Unitless)
X Unit: Engine Speed (RPM)
Y Units: Engine Air Flow (grams/second)

y/x	750	1,250	1,750	2,000	2,500	3,000	3,250	3,500	4,000	4,250	4,500	4,750	5,000	5,250	5,500	5,750	6,000
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.988	0.976	0.986	0.986
15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.954	0.964	0.996	0.996
30	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.925	0.909	0.993	0.993
45	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.950	0.943	0.988	0.988
60	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.965	0.937	0.998	0.998
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.956	0.947	0.996	0.996
90	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.951	0.901	0.997	0.997
105	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.956	0.903	0.992	0.992
120	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.932	0.911	0.992	0.992
135	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.913	0.933	0.993	0.993
150	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.886	0.921	0.992	0.992
165	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.888	0.935	0.991	0.991
180	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.863	0.931	0.992	0.992
195	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.839	0.870	0.990	0.990
210	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.862	0.862	0.990	0.990
230	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.964	0.910	0.990	0.990
250	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.967	0.969	0.999	0.999

Initial Supporting table - P1400_CatalystLightOffExtendedEngineRunTimeExit

Description: Exit Catalyst Warm-up mode if Engine Run Time is greater than this value. This table is based on percent ethanol (x-axis) and catmon's NormRatio_EWMA value (y-axis). The NormRatio_EWMA value determines the state of the catalyst. Typically, NormRatio_EWMA values below 0.35 (0 is bad and 1 is good) represent catalysts that have degraded. The emission performance of these degraded catalysts can be improved by extending catalyst light off of GetE85R_Pct_FFS_CompAtEngFloat.

y/x	0	25	50	75	100
0.000	35	35	35	35	35
0.125	35	35	35	35	35
0.250	35	35	35	35	35
0.375	35	35	35	35	35
0.500	35	35	35	35	35
0.625	35	35	35	35	35
0.750	35	35	35	35	35
0.875	35	35	35	35	35
1.000	35	35	35	35	35

Initial Supporting table - P1400_ColdStartDiagnosticDelayBasedOnEngineRunTime

Description: Quality weight-based on engine run time. This allows adjustment of the weighting factors at various engine run times in order to prevent the updating of the cumulative quality timer or to change the value of the average qualified residual energy calculation to prevent false Fails of the diagnostic under circumstances inappropriate to update the calculation of the average qualified residual value.

y/x	0	3	4	4	5	10	15	20	30
1	0	0	0	1	1	1	1	1	1

Initial Supporting table - P1400_ColdStartDiagnosticDelayBasedOnEngineRunTimeCalAxis

Description: This is the x-axis for the KtCSED_K_TimeWght calibration table. Refer to the description for KtCSED_K_TimeWght for details.

y/x	1	2	3	4	5	6	7	8	9
1	0	3	4	4	5	10	15	20	30

Initial Supporting table - P1400_EngineSpeedResidual_Table

Description: This 1x17 table of engine exhaust flow values is used to calculate both the desired and the actual engine exhaust flow based on desired and actual engine speed. The desired engine exhaust flow is gathered from the desired engine speed (VeSPDR_n_EngDsrd). The value used for the actual engine exhaust flow is based on the actual engine RPM value.

y/x	600	800	850	900	950	1,000	1,020	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500
1	0	0	0	0	0	0	0	2	3	3	10	10	10	10	10	10	10

Initial Supporting table - P1400_SparkResidual_Table

Description: Predicted engine-out energy potential based on either the desired cold start spark advance value or the actual spark advance value. ExhEngyPerlInitMass calibration is used to calculate both desired exhaust energy and actual energy. The desired and actual exhaust energy per unit mass values are used in part to calculate the desired exhaust energy per unit time and actual exhaust energy per unit time. Both desired and actual go into the residual exhaust energy per unit time calculation.

y/x	-19	-15	-7	-5	-4	6	8	10	12
1	3.00	3.00	3.00	1.00	0.00	0.00	0.00	0.00	0.00

Initial Supporting table - Alp»haDisagreement Limit

Description: Alpha Disagreement Limit

Value Units: Percent
X Unit: Percent
Y Units: Percent

y/x	0.0	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
0.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10.0	20.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	20.0
20.0	20.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	15.0	20.0
30.0	20.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	15.0	20.0
40.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	15.0	20.0
50.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	15.0	20.0
60.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	15.0	20.0
70.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	15.0	20.0
80.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	15.0	20.0
90.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	15.0	20.0
100.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	15.0	20.0

Initial Supporting table - Beta Disagreement Limit

Description: Beta Disagreement Limit

Value Units: Percent
X Unit: Percent
Y Units: Percent

y/x	0.0	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
0.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
20.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
30.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	10.0	10.0
40.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	10.0	10.0
50.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	15.0	20.0
60.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	15.0	20.0
70.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	10.0	15.0	20.0
80.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	15.0	20.0
90.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	15.0	20.0
100.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	15.0	20.0

Initial Supporting table - P0420_BestFailingOSCTableB1

Description: This table is a 9x17 table of baseline Best Failing (e.g. threshold converter) OSC times for catalyst Bank 1. The axis' for this table include the average airflow and the catalyst temperature. After OSC is measured for a specific temp and airflow, the BestFailing OSC value is found within this table for the measured temp and airflow and is used along with the OSC_TimeRaw (and the WorstPassing value) to calculate the Normalized Ratio for that specific test. The values in this table are based on the measured OSC for the identified BPU converter that is used for MIL illumination across the specific temp and airflow range for a given program.

Value Units: sec
X Unit: g/s
Y Units: degC

y/x	2.38	2.74	3.09	3.44	3.79	4.15	4.50	4.85	5.21	5.56	5.91	6.27	6.62	6.97	7.33	7.68	8.03
490.00	1.61	1.34	1.12	0.94	0.81	0.73	0.68	0.66	0.64	0.62	0.59	0.56	0.54	0.52	0.50	0.49	0.48
535.00	1.63	1.36	1.14	0.96	0.83	0.75	0.70	0.68	0.66	0.64	0.61	0.58	0.56	0.54	0.52	0.51	0.50
580.00	1.65	1.38	1.16	0.98	0.85	0.77	0.72	0.70	0.68	0.66	0.63	0.60	0.58	0.56	0.54	0.53	0.52
625.00	1.67	1.40	1.18	1.00	0.87	0.79	0.74	0.72	0.70	0.68	0.65	0.62	0.60	0.58	0.56	0.55	0.54
670.00	1.68	1.41	1.19	1.01	0.88	0.80	0.75	0.73	0.71	0.69	0.66	0.63	0.61	0.59	0.57	0.56	0.55
715.00	1.72	1.45	1.23	1.05	0.91	0.82	0.77	0.75	0.73	0.71	0.68	0.65	0.63	0.61	0.59	0.58	0.57
760.00	1.79	1.52	1.30	1.10	0.94	0.84	0.79	0.76	0.74	0.72	0.69	0.66	0.64	0.62	0.60	0.59	0.58
805.00	1.87	1.60	1.38	1.16	0.98	0.87	0.82	0.78	0.76	0.74	0.71	0.68	0.66	0.64	0.62	0.61	0.60
850.00	1.94	1.67	1.45	1.21	1.01	0.90	0.84	0.80	0.78	0.76	0.73	0.70	0.68	0.66	0.64	0.63	0.62

Initial Supporting table - P0420_WorstPassingOSCTableB1

Description: This table is a 9x17 table of WorstPassing (e.g. 120k) OSC times for catalyst Bank 1. The axis' for this table include the average airflow and the catalyst temperature. After OSC is measured for a specific temp and airflow, the WorstPassing OSC value is found within this table for the measured temp and airflow and is used along with the OSC_TimeRaw (and the BestFailing OSC value) to calculate the Normalized Ratio for that specific test.The values in this table are based on the measured OSC for the WPA part across the temp and airflow range.

Value Units: sec
X Unit: g/s
Y Units: degC

y/x	2.38	2.74	3.09	3.44	3.79	4.15	4.50	4.85	5.21	5.56	5.91	6.27	6.62	6.97	7.33	7.68	8.03
490.00	2.90	2.53	2.21	1.94	1.72	1.55	1.41	1.31	1.23	1.16	1.09	1.02	0.96	0.91	0.86	0.82	0.78
535.00	2.92	2.55	2.23	1.96	1.74	1.57	1.43	1.33	1.25	1.18	1.11	1.04	0.98	0.93	0.88	0.84	0.80
580.00	2.94	2.57	2.25	1.97	1.75	1.59	1.45	1.35	1.27	1.20	1.13	1.06	1.00	0.95	0.90	0.86	0.82
625.00	2.96	2.59	2.26	1.98	1.76	1.60	1.47	1.37	1.29	1.22	1.15	1.08	1.02	0.97	0.92	0.88	0.84
670.00	2.97	2.60	2.27	1.99	1.77	1.62	1.48	1.38	1.30	1.23	1.16	1.09	1.03	0.98	0.93	0.88	0.84
715.00	3.01	2.64	2.31	2.03	1.79	1.64	1.50	1.40	1.32	1.25	1.18	1.11	1.04	0.99	0.93	0.88	0.83
760.00	3.08	2.71	2.38	2.09	1.84	1.66	1.51	1.41	1.33	1.26	1.19	1.12	1.06	1.01	0.94	0.88	0.83
805.00	3.16	2.79	2.47	2.16	1.89	1.69	1.53	1.43	1.35	1.28	1.21	1.14	1.08	1.03	0.95	0.89	0.83
850.00	3.23	2.86	2.54	2.21	1.92	1.72	1.55	1.45	1.37	1.30	1.23	1.16	1.09	1.04	0.97	0.89	0.84

Initial Supporting table - P0494_LIN_Threshold

Description: Tabulated LIN Fan1 Speed Low Limits

Value Units: rpm
X Unit: Commanded LIN Fan1 Speed (rpm)
Y Units: Sensed LIN Fan1 Speed Lower Limit (rpm)

y/x	0	800	2,750	2,751	2,752	2,753	2,754	2,755	2,756	2,757	2,758	2,759	2,760	2,761	2,762	2,763	2,764
1	0	600	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540

Initial Supporting table - P0606 PFM Sequence Fail f(Loop Time)

Description: Fail threshold for PFM per operating loop.

Value Units: Fail threshold for PFM (count)
X Unit: Operating Loop (enum)

P0606 PFM Sequence Fail f(Loop Time) - Part 1				
y/x	CePISR_e_2p5msFlow	CePISR_e_3p125msFlow	CePISR_e_5msFlow	CePISR_e_6p25msFlow
1	3	3	3	3
P0606 PFM Sequence Fail f(Loop Time) - Part 2				
y/x	CePISR_e_1OmsFlow	CePISR_e_12p5msFlow	CePISR_e_20msFlow	CePISR_e_25msFlow
1	3	3	3	3
P0606 PFM Sequence Fail f(Loop Time) - Part 3				
y/x	CePISR_e_40msFlow	CePISR_e_50msFlow	CePISR_e_80msFlow	CePISR_e_1OOmsFlow
1	2	2	2	2
P0606 PFM Sequence Fail f(Loop Time) - Part 4				
y/x	CePISR_e_250msFlow			
1	2			

Initial Supporting table - P0606 PFM Sequence Sample f(Loop Time)

Description: Sample threshold for PFM per operating loop.

Value Units: Sample threshold for PFM (count)
X Unit: Operating Loop (enum)

P0606 PFM Sequence Sample f(Loop Time) - Part 1				
y/x	CePISR_e_2p5msFlow	CePISR_e_3p125msFlow	CePISR_e_5msFlow	CePISR_e_6p25msFlow
1	4	4	4	4

P0606 PFM Sequence Sample f(Loop Time) - Part 2				
y/x	CePISR_e_1OmsFlow	CePISR_e_12p5msFlow	CePISR_e_20msFlow	CePISR_e_25msFlow
1	4	4	4	4

P0606 PFM Sequence Sample f(Loop Time) - Part 3				
y/x	CePISR_e_40msFlow	CePISR_e_50msFlow	CePISR_e_80msFlow	CePISR_e_1OOmsFlow
1	3	3	3	3

P0606 PFM Sequence Sample f(Loop Time) - Part 4				
y/x	CePISR_e_250msFlow			
1	3			

Initial Supporting table - P0606 PFM Enable f(Loop Time)

Description: PFM Enable

Value Units: PFM enable flag (boolean)
X Unit: Operating Loop Time Sequence (enum)

P0606 PFM.Enable f(Loop Time) - Part 1				
y/x	CePISR_e_2p5msFlow	CePISR_e_3p125msFlow	CePISR_e_5msFlow	CePISR_e_6p25msFlow
1	0	1	0	1
P0606 PFM.Enable f(Loop Time) - Part 2				
y/x	CePISR_e_1OmsFlow	CePISR_e_12p5msFlow	CePISR_e_20msFlow	CePISR_e_25msFlow
1	0	1	0	1
P0606 PFM.Enable f(Loop Time) - Part 3				
y/x	CePISR_e_40msFlow	CePISR_e_50msFlow	CePISR_e_80msFlow	CePISR_e_1OOmsFlow
1	0	1	0	1
P0606 PFM.Enable f(Loop Time) - Part 4				
y/x	CePISR_e_250msFlow			
1	1			

Initial Supporting table - P060C_DecelOffset f(VehicleSpeed)

Description: The axle torque offset from road load that represents 0.02 G of deceleration.

Value Units: Nm
X Unit: Vehicle Speed (kph)

y/x	45	50	55	60	70	80	90	100	110	115	130	135	145	160	175	185	200
1	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487	172.487

Initial Supporting table - P060C_Delta MAP Threshold f(Desired Engine Torque)

Description: Engine Sync based and Time based delta pressure threshold above which Torque Security error is reported.

Value Units: Torque Security Threshold for Engine Sync and Time Based Delta Pressure (kPa)
X Unit: Desired Engine Torque (Nm)

y/x	0.00	50.00	100.00	150.00	200.00	300.00
1.00	39.91	39.91	39.91	39.91	39.91	39.91

Initial Supporting table - P060C_Roadl_oad f(Vehicle Speed)

Description: Actual Axle Torque threshold above which Torque Security error is reported on a Coastdown

Value Units: Nm
X Unit: Vehicle Speed (kph)

y/x	45.0	50.0	55.0	60.0	70.0	80.0	90.0	100.0	110.0	115.0	130.0	135.0	145.0	160.0	175.0	185.0	200.0
1.0	182.487	182.487	182.487	182.487	213.619	256.507	304.645	358.036	416.677	447.968	549.715	586.257	663.279	788.659	925.854	1,023.882	1,180.771

Initial Supporting table - P060C_Speed Control External Load f(Oil Temp, RPM)

Description: Specifies the external load table for SPDR torque security as a function of engine oil temperature and engine RPM.

Value Units: External Load Table for SPDR (Nm)
X Unit: Engine Oil Temperature (deg C)
Y Units: Engine Speed (RPM)

y/x	-40.00	-20.00	-10.00	0.00	50.00	90.00
350.00	154.92	114.90	86.92	84.78	67.01	27.70
450.00	154.92	114.90	86.92	84.78	67.01	27.70
550.00	154.92	114.90	86.92	84.78	67.01	27.70
650.00	154.92	114.90	86.92	84.78	67.01	27.70
750.00	154.92	114.90	86.92	84.78	67.01	24.70
850.00	174.12	130.51	98.73	91.44	74.68	25.41
900.00	185.95	140.56	106.21	93.65	79.32	25.54
1,000.00	210.97	160.01	122.06	97.04	88.87	26.67
1,100.00	237.54	176.84	137.68	101.23	97.95	37.56
1,200.00	262.59	188.82	148.65	114.32	102.18	47.91
1,450.00	303.79	216.94	159.25	135.17	96.54	60.73
1,700.00	201.78	140.38	80.64	52.17	21.55	15.94
1,950.00	155.72	103.33	48.91	23.81	-3.61	-15.00
2,200.00	125.11	75.69	24.43	1.33	-24.19	-28.60
3,200.00	-107.05	-107.05	-107.05	-107.05	-107.05	-107.05
4,200.00	-117.76	-117.76	-117.76	-117.76	-117.76	-117.76
6,400.00	-128.46	-128.46	-128.46	-128.46	-128.46	-128.46

Initial Supporting table - Shutter 1 AC OFF - Open / Close Commands

Description: Open / Close Commands for Shutter 1 - AC OFF

Value Units: Percent
X Unit: KPH
Y Units: Fan Command Percent

y/x	0	1	2	3	4	5	6	7	8	9
0	0	100	100	100	100	100	100	100	100	100
1	0	100	100	100	100	100	100	100	100	100
2	0	100	100	100	100	100	100	100	100	100
3	0	100	100	100	100	100	100	100	100	100
4	0	65	65	65	65	65	65	65	65	65
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - Shutter 1 AC OFF - Percent Fan Command Axis

Description: Percent Fan Command Axis for Shutter 1 - AC OFF Table

Value Units: Percent

y/x	1	2	3	4	5	6	7	8	9	10
1	0	15	22	25	33	40	44	50	65	77

Initial Supporting table - Shutter 1 AC OFF - Vehicle Speed Axis

Description: Vehicle Speed Axis for Shutter 1 - AC OFF Table

Value Units: KPH

y/x	1	2	3	4	5	6	7	8	9	10
1	0	25	50	75	100	150	175	200	225	250

Initial Supporting table - Shutter 1 AC ON - Open / Close Commands

Description: Open / Close Commands for Shutter 1 - AC ON

Value Units: Percent
X Unit: KPH
Y Units: Fan Command Percent

y/x	0	1	2	3	4	5	6	7	8	9
0	0	100	100	100	100	100	100	100	100	100
1	0	100	100	100	100	100	100	100	100	100
2	0	100	100	100	100	100	100	100	100	100
3	0	100	100	100	100	100	100	100	100	100
4	0	65	65	65	65	65	65	65	65	65
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - Shutter 1 AC ON - Percent Fan Command Axis

Description: Percent Fan Command Axis for Shutter 1 - AC ON Table

Value Units: Percent

y/x	1	2	3	4	5	6	7	8	9	10
1	0	15	22	25	33	40	44	50	65	77

Initial Supporting table - Shutter 1 AC ON - Vehicle Speed Axis

Description: Vehicle Speed Axis for Shutter 1 - AC ON Table

Value Units: KPH

y/x	1	2	3	4	5	6	7	8	9	10
1	0	25	50	75	100	150	175	200	225	250

Initial Supporting table - Shutter 2 AC OFF - Open / Close Commands

Description: Open / Close Commands for Shutter 2 - AC OFF

Value Units: Percent
X Unit: KPH
Y Units: Fan Command Percent

y/x	0	1	2	3	4	5	6	7	8	9
0	0	100	100	100	100	100	100	100	100	100
1	0	100	100	100	100	100	100	100	100	100
2	0	100	100	100	100	100	100	100	100	100
3	0	100	100	100	100	100	100	100	100	100
4	0	50	50	50	50	50	50	50	50	50
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - Shutter 2 AC OFF - Percent Fan Command Axis

Description: Percent Fan Command Axis for Shutter 2 - AC OFF Table

Value Units: Percent

y/x	1	2	3	4	5	6	7	8	9	10
1	0	15	22	25	33	40	44	50	65	77

Initial Supporting table - Shutter 2 AC OFF - Vehicle Speed Axis

Description: Vehicle Speed Axis for Shutter 2 - AC OFF Table

Value Units: KPH

y/x	1	2	3	4	5	6	7	8	9	10
1	0	25	50	75	100	150	175	200	225	250

Initial Supporting table - Shutter 2 AC ON - Open / Close Commands

Description: Open / Close Commands for Shutter 2 - AC ON

Value Units: Percent
X Unit: KPH
Y Units: Fan Command Percent

y/x	0	1	2	3	4	5	6	7	8	9
0	0	100	100	100	100	100	100	100	100	100
1	0	100	100	100	100	100	100	100	100	100
2	0	100	100	100	100	100	100	100	100	100
3	0	100	100	100	100	100	100	100	100	100
4	0	50	50	50	50	50	50	50	50	50
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - Shutter 2 AC ON - Percent Fan Command Axis

Description: Percent Fan Command Axis for Shutter 2 - AC ON Table

Value Units: Percent

y/x	1	2	3	4	5	6	7	8	9	10
1	0	15	22	25	33	40	44	50	65	77

Initial Supporting table - Shutter 2 AC ON - Vehicle Speed Axis

Description: Vehicle Speed Axis for Shutter 2 - AC ON Table

Value Units: KPH

y/x	1	2	3	4	5	6	7	8	9	10
1	0	25	50	75	100	150	175	200	225	250

Initial Supporting table - Closed Loop Enable Clarification - KaFCLP_U_SIphrIntglOfst_Thrsh

Description: Integral Offset voltage thresholds (bank and cell specific cals) used with KeFCLP_Pct_CatAccuSlphrPostDsbl to check for sulphur poisoning.

Value Units: millivolts
X Unit: Post Catalyst Number

y/x	CiOXYR_O2_PostCat1	CiOXYR_O2_PostCat2
CiFCLP_Decel	2,048	2,048
CiFCLPJdle	2,048	2,048
CiFCLP_Cruise	2,048	2,048
CiFCLP_LightAccel	2,048	2,048
CiFCLP_HeavyAccel	2,048	2,048

Initial Supporting table - Closed Loop Enable Clarification - KcFCLP_Cnt_O2RdyCyclesThrsh

Description: Number of times a post oxygen sensor value must be in range before declaring it ready

Value Units: Time (events * 12.5 milliseconds)

y/x	1
1	10

Initial Supporting table - Closed Loop Enable Clarification - KcFULC_O2_SensorReadyEvents

Description: Number of times a pre oxygen sensor value must be in range before declaring it ready

Value Units: Time (events * 12.5 milliseconds)

y/x	1
1	10

Initial Supporting table - Closed Loop Enable Clarification - KeEOSDURichThrsh

Description: The oxygen sensor voltage above which a sensor will be considered failing during a Rich Test.

Value Units: Volts

y/x	1
1	1,050

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_dm_IntegrationAirflowMax

Description: Maximum allowed estimated airflow for post 02 integral terms to be updated.

Value Units: Grams per Second

y/x	1
1	512

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_Pct_CatAccuSlphrPostDsbl

Description: Sulphur percent threshold above which post integral learning is disabled if the threshold criteria KaFCLP_U_SlphrIntglOfst_Thrsh is also met.

Value Units: Percent

y/x	1
1	255

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_T_IntegrationCatalystMax

Description: Maximum allowed estimated catalytic converter temperature for post 02 integral terms to be updated.

Value Units: Celcius

y/x	1
1	1,000

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_T_IntegrationCatalystMin

Description: Minimum allowed estimated catalytic converter temperature to begin using post 02 integration correction terms. Converter temperature must remain above this threshold to ramp-in the post 02 integration adjustments. Once the ramp-in has started, a converter temperature below this threshold will freeze the ramp-in multiplier. Post 02 integration will not be allowed below this converter temperature

Value Units: Celcius

y/x	1
1	425

Initial Supporting table - Closed Loop Enable Clarification - KeFULC_T_WRAF_SensorReadyThrsh

Description: Pumping cell temperature threshold above which the wideband oxygen sensor will be considered ready for use

Value Units: Degrees Celcius

y/x	1
1	650

Initial Supporting table - Closed Loop Enable Clarification - KeWRSC_T_HtrCntrlCL

Description: WRAF heater temperature enabling threshold fortransition from Open Loop to Closed Loop

Value Units: Degrees Celcius

y/x	1
1	628

Initial Supporting table - Closed Loop Enable Clarification - KeWRSI_T_PumpCurrentEnable

Description: WRAF heater temperature threshold for enabling the sensor pump current

Value Units: Degrees Celcius

y/x	1
1	628

Initial Supporting table - Closed Loop Enable Clarification - KfFCLL_T_AdaptiveLoCoolant

Description: LTM learning is inhibited if the engine coolant temperature is below this calibration.

Value Units: Degrees Celcius

y/x	1
1	50

Initial Supporting table - Closed Loop Enable Clarification - KfFCLP_U_O2ReadyThrshLo

Description: Voltage limit checked against when determining if a post converter oxygen sensor is in range

Value Units: millivolts

y/x	1
1	1,100

Initial Supporting table - Closed Loop Enable Clarification - KfFULC_U_O2_SensorReadyThrshLo

Description: Voltage limit checked against when determining if a pre converter oxygen sensor is in range

Value Units: millivolts

y/x	1
1	1,250

Initial Supporting table - Closed Loop Enable Clarification - KtFCLL_p_AdaptiveLowMAP_Limit

Description: Long term fuel learning is disabled below this MAP limit as a function of barometric pressure.

Value Units: KPa
X Unit: KPa

y/x	65	70	75	80	85	90	95	100	105
1	16.0	16.0	16.0	16.0	16.0	17.0	18.0	18.0	18.0

Initial Supporting table - Closed Loop Enable Clarification - KtFCLP_t_PostIntglDisableTime

Description: Disable integral offset after engine start for this amount of time as a function of start up coolant temperature.

Value Units: Time in seconds
X Unit: Degrees Celcius

y/x	-40	-29	-18	-6	5	16	28	39	50	61	73	84	95	106	118	129	140
1	409.0	409.0	409.0	409.0	400.0	240.0	240.0	150.0	60.0	60.0	60.0	60.0	60.0	20.0	20.0	20.0	20.0

Initial Supporting table - Closed Loop Enable Clarification - KtFCLPtPostIntglRampInTime

Description: Time required to ramp integral offset to desired value as a function of start up coolant temperature.

Value Units: Time in seconds
X Unit: Degrees Celcius

y/x	-40	-29	-18	-6	5	16	28	39	50	61	73	84	95	106	118	129	140
1	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	40.0	30.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0

Initial Supporting table - Closed Loop Enable Clarification - KtFSTA_t_ClosedLoopAutostart

Description: Engine run time following an autostart, as a function of begin run coolant, which must be exceeded to enable CLOSED LOOP.

Value Units: Time in seconds
X Unit: Degrees Celcius

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
0	300.0	300.0	230.0	90.0	80.0	32.0	20.0	0.6	0.6	0.6	0.6	0.2	0.2	0.2	0.2	0.2	0.2
25	300.0	300.0	230.0	90.0	80.0	32.0	20.0	0.6	0.6	0.6	0.6	0.2	0.2	0.2	0.2	0.2	0.2
50	300.0	300.0	230.0	90.0	80.0	32.0	20.0	0.6	0.6	0.6	0.6	0.2	0.2	0.2	0.2	0.2	0.2
75	300.0	300.0	230.0	90.0	80.0	32.0	20.0	0.6	0.6	0.6	0.6	0.2	0.2	0.2	0.2	0.2	0.2
100	300.0	300.0	230.0	90.0	80.0	32.0	20.0	0.6	0.6	0.6	0.6	0.2	0.2	0.2	0.2	0.2	0.2

Initial Supporting table - Closed Loop Enable Clarification - KtFSTA_t_ClosedLoopTime

Description: Engine run time, as a function of startup coolant temperature, which must be exceeded to enable CLOSED LOOP.

Value Units: Time in seconds
X Unit: Degrees Celcius

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
0	300.0	300.0	230.0	160.0	95.0	32.0	32.0	32.0	32.0	32.0	17.0	17.0	17.0	30.0	45.0	45.0	45.0
25	300.0	300.0	230.0	160.0	95.0	32.0	32.0	32.0	32.0	32.0	17.0	17.0	17.0	30.0	45.0	45.0	45.0
50	300.0	300.0	230.0	160.0	95.0	32.0	32.0	32.0	32.0	32.0	17.0	17.0	17.0	30.0	45.0	45.0	45.0
75	300.0	300.0	230.0	160.0	95.0	32.0	32.0	32.0	32.0	32.0	17.0	17.0	17.0	30.0	45.0	45.0	45.0
100	300.0	300.0	230.0	160.0	95.0	32.0	32.0	32.0	32.0	32.0	17.0	17.0	17.0	30.0	45.0	45.0	45.0

Initial Supporting table - P0442 Volatility Time as a Function of Estimate of Ambient Temperature

Description: EONV volatility time as a function of estimated ambient temperature

Value Units: Volatility time (seconds)
X Unit: Estimated Ambient Temperature (Deg C)

y/x	-10	-4	1	7	13	18	24	29	35	41	46	52	58	63	69	74	80
1	30	30	30	30	60	120	210	325	340	350	500	500	500	500	500	500	500

Initial Supporting table - P0442 Engine Off Time Before Vehicle Off Maximum as a Function of Estimated Ambient Temperature

Description: Maximum engine off time before vehicle off time as a function of estimated ambient temperature (EAT)

Value Units: Maximum Engine Off Time Before Vehicle Off Time (seconds)
X Unit: Estimated Ambient Temperature (Deg C)

y/x	-10	-4	1	7	13	18	24	29	35	41	46	52	58	63	69	74	80
1	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30

Initial Supporting table - P0442 EONV Pressure Threshold (Pascals)

Description: EONV pressure threshold as a function of fuel level and estimated ambient temperature (EAT)

Value Units: EONV Pressure Threshold (Pascals)
X Unit: Fuel Level (percent) from 0 to 100 with step size 6.25
Y Units: Estimated Ambient Temperature (deg C) from -10 to 80 with step size 5.625

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
3	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
4	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
5	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
6	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
7	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
8	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
9	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
10	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
11	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
12	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
13	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
14	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
15	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
16	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2
17	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2	-280.2

Initial Supporting table - P057B KtBRKI K CmpItTestPointWeight

Description:

y/x	0.000	0.005	0.015	0.026	0.036	0.046	0.073	0.109	1.000
1	0	0	0	0	1	1	1	1	1

Initial Supporting table - P057B KtBRKl K FastTestPointWeight

Description:

y/x	0.000	0.005	0.015	0.026	0.036	0.046	0.073	0.109	1.000
1	0	0	0	0	1	1	1	1	1

Initial Supporting table - DFCO CoolEnblHi Temp

Description:

y/x	-40	0	25
1	30.0	25.0	20.0

Initial Supporting table - DFCO_DisblLo_Gear1

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO DriverRequestZeroPedalTrq DsblOf

Description:

DFCO_DriverRequestZeroPedalTrq_DsblOf - Part 1

y/x	CeDTRR_e_TrqShapingRateA	CeDTRR_e_TrqShapingRateB	CeDTRR_e_TrqShapingRateC	CeDTRR_e_TrqShapingRateD	CeDTRR_e_TrqShapingRateE
CeTCOR_e_Exh_Normal	15	15	15	15	15
CeTCOR_e_Exh_Sport	15	15	15	15	15
CeTCOR_e_Exh_Track	15	15	15	15	15

DFCO_DriverRequestZeroPedalTrq_DsblOf - Part 2

y/x	CeDTRR_e_TrqShapingRateF	CeDTRR_e_TrqShapingRateG	CeDTRR_e_TrqShapingRateH	CeDTRR_e_TrqShapingRateI	CeDTRR_e_TrqShapingRateJ
CeTCOR_e_Exh_Normal	15	15	15	15	15
CeTCOR_e_Exh_Sport	15	15	15	15	15
CeTCOR_e_Exh_Track	15	15	15	15	15

Initial Supporting table - DFCO DriverRequestZeroPedalTrq EnblOf

Description:

DFCO_DriverRequestZeroPedalTrq_EnblOf - Part 1

y/x	CeDTRR_e_TrqShapingRateA	CeDTRR_e_TrqShapingRateB	CeDTRR_e_TrqShapingRateC	CeDTRR_e_TrqShapingRateD	CeDTRR_e_TrqShapingRateE
CeTCOR_e_Exh_Normal	10	10	10	10	10
CeTCOR_e_Exh_Sport	10	10	10	10	10
CeTCOR_e_Exh_Track	10	10	10	10	10

DFCO_DriverRequestZeroPedalTrq_EnblOf - Part 2

y/x	CeDTRR_e_TrqShapingRateF	CeDTRR_e_TrqShapingRateG	CeDTRR_e_TrqShapingRateH	CeDTRR_e_TrqShapingRateI	CeDTRR_e_TrqShapingRateJ
CeTCOR_e_Exh_Normal	10	10	10	10	10
CeTCOR_e_Exh_Sport	10	10	10	10	10
CeTCOR_e_Exh_Track	10	10	10	10	10

Initial Supporting table - DFCO_DsblLo_Gear10

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Gear2

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Gear3

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Gear4

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Gear5

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Gear6

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Gear7

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Gear8

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Gear9

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO DsblLo GearN

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO DsblLo GearP

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO DsblLo GearR

Description:

y/x	15	16	60	100	140
1	950	950	950	950	950

Initial Supporting table - DFCO_DsblLo_Vehicle_Speed

Description:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	30	30
CeTGRR_e_TransGr2	21	21
CeTGRR_e_TransGr3	18	18
CeTGRR_e_TransGr4	16	16
CeTGRR_e_TransGr5	0	0
CeTGRR_e_TransGr6	0	0
CeTGRR_e_TransGr9	512	512
CeTGRR_e_TransGr10	512	512
CeTGRR_e_TransGrNeut	0	0
CeTGRR_e_TransGrRvrs	512	512
CeTGRR_e_TransGrPark	0	0
CeTGRR_e_TransGr7	0	0
CeTGRR_e_TransGr8	0	0

Initial Supporting table - DFCO EnblHi Vehicle Speed

Description:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	32.0	32.0
CeTGRR_e_TransGr2	26.0	26.0
CeTGRR_e_TransGr3	26.0	26.0
CeTGRR_e_TransGr4	20.0	20.0
CeTGRR_e_TransGr5	0.0	0.0
CeTGRR_e_TransGr6	0.0	0.0
CeTGRR_e_TransGr9	512.0	512.0
CeTGRR_e_TransGr10	512.0	512.0
CeTGRR_e_TransGrNeut	0.0	0.0
CeTGRR_e_TransGrRvrs	512.0	512.0
CeTGRR_e_TransGrPark	0.0	0.0
CeTGRR_e_TransGr7	0.0	0.0
CeTGRR_e_TransGr8	0.0	0.0

Initial Supporting table - DFCO_EnblHii_Engine_Speed

Description:

DFCO_EnblHii_Engine_Speed - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGr9
1	1,100	1,100	1,100	1,100	1,100	1,100	1,100

DFCO_EnblHii_Engine_Speed - Part 2

y/x	CeTGRR_e_TransGr10	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	1,100	1,100	1,100	1,100	1,100	1,100	

Initial Supporting table - DFCO EngSpdEnblOfst

Description:

y/x	-1,750	-1,500	-1,250	-1,000	-750	-500	-300	-100	0
1	500	400	250	150	100	50	0	0	0

Initial Supporting table - DFCO ZeroPedalTorqueDisableOfst

Description:

DFCO_ZeroPedalTorqueDisableOfst - Part 1

y/x	CeDTRR_e_TrqShapingRateA	CeDTRR_e_TrqShapingRateB	CeDTRR_e_TrqShapingRateC	CeDTRR_e_TrqShapingRateD	CeDTRR_e_TrqShapingRateE
CeTCOR_e_Exh_Normal	10	10	10	10	10
CeTCOR_e_Exh_Sport	10	10	10	10	10
CeTCOR_e_Exh_Track	10	10	10	10	10

DFCO_ZeroPedalTorqueDisableOfst - Part 2

y/x	CeDTRR_e_TrqShapingRateF	CeDTRR_e_TrqShapingRateG	CeDTRR_e_TrqShapingRateH	CeDTRR_e_TrqShapingRateI	CeDTRR_e_TrqShapingRateJ
CeTCOR_e_Exh_Normal	10	10	10	10	10
CeTCOR_e_Exh_Sport	10	10	10	10	10
CeTCOR_e_Exh_Track	10	10	10	10	10

Initial Supporting table - Minimum Non-Purge Samples for Purge Vapor Fuel

Description: Number of Fuel Trim Monitor sample counts required to allow the Purge Vapor Fuel value to inhibit the Intrusive Rich test

Value Units: Sample Counts per loop rate of 100ms (divide by 10 to get seconds)
X Unit: Long Term Fuel Trim Cell I.D. (no units) (Only PurgeOff cells are used)

Minimum Non-Purge Samples for Purge Vapor Fuel - Part 1				
y/x	CeFADR_e_CellOO_PurgOnAirMode 5	CeFADR_e_Cell01_PurgOnAirMode 4	CeFADR_e_Cell02_PurgOnAirMode 3	CeFADR_e_Cell03_PurgOnAirMode 2
1	65,535	65,535	65,535	65,535
Minimum Non-Purge Samples for Purge Vapor Fuel - Part 2				
y/x	CeFADR_e_Cell04_PurgOnAirMode 1	CeFADR_e_Cell05_PurgOnAirMode 0	CeFADR_e_Cell06_PurgOnIdle	CeFADR_e_Cell07_PurgOnDecel
1	65,535	65,535	65,535	65,535
Minimum Non-Purge Samples for Purge Vapor Fuel - Part 3				
y/x	CeFADR_e_Cell08_PurgOffAirMode 5	CeFADR_e_Cell09_PurgOffAirMode 4	CeFADR_e_Cell 10_PurgOffAirMode 3	CeFADR_e_Cell11_PurgOffAirMode 2
1	250	65,535	65,535	65,535
Minimum Non-Purge Samples for Purge Vapor Fuel - Part 4				
y/x	CeFADR_e_Cell 12_PurgOffAirMode 1	CeFADR_e_Cell13_PurgOffAirMode 0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell1 5_PurgOffDecel
1	65,535	65,535	100	100

Initial Supporting table - P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage

Description: Identifies which Long Term Fuel Trim Cell I.D.s are used for diagnosis. Only cells identified as "CeFADD_e_Non8electedCeH" are not used for diagnosis.

P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 1				
y/x	CeFADR_e_CellOO_PurgOnAirMode 5	CeFADR_e_Cell01_PurgOnAirMode 4	CeFADR e Cell02 PurgOnAirMode 3	CeFADR_e_Cell03_PurgOnAirMode 2
1	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell
P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 2				
y/x	CeFADR_e_Cell04_PurgOnAirMode 1	CeFADR e Cell05 PurgOnAirMode 0	CeFADR_e_Cell06_PurgOnldle	CeFADR_e_Cell07_PurgOnDecel
1	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_NonSelectedCell
P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 3				
y/x	CeFADR_e_Cell08_PurgOffAirMode 5	CeFADR_e_Cell09_PurgOffAirMode 4	CeFADR e Cell10 PurgOffAirMode 3	CeFADR_e_Cell11_PurgOffAirMode 2
1	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell
P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 4				
y/x	CeFADR_e_Cell12_PurgOffAirMode 1	CeFADR e Cell13 PurgOffAirMode 0	CeFADR_e_Cell14_PurgOffldle	CeFADR_e_Cell15_PurgOffDecel
1	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_NonSelectedCell

Initial Supporting table - Startup Engine Coolant adjusment to Minimum accumulation time

Description: Time offset added to the minimum accumulation time based on Startup Coolant.

Value Units: Counts (10 counts equals 1 second)
X Unit: Degree C

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	194	194	152	110	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - P0068_Delta MAF Threshold f(TPS)

Description: Table of delta MAF values as a function of desired throttle position. The output of this table provides a delta MAF that if the measured minus the estimated MAF exceeds, is considered a fail.

Value Units: Delta MAF Values (dm)
X Unit: Desired Throttle Position (Pct)

y/x	10.63	21.26	24.32	27.38	30.44	33.51	43.51	71.75	100.00
1.00	43.92	43.92	45.68	47.45	49.21	50.98	255.00	255.00	255.00

Initial Supporting table - P0068_Delta MAP Threshold f(TPS)

Description: Table of delta MAP values as a function of desired throttle position. The output of this table provides a delta MAP that if the measured minus the estimated MAP exceeds, is considered a fail.

Value Units: Delta MAP Values (kPa)
X Unit: Desired Throttle Position (Pct)

y/x	10.63	21.26	24.32	27.38	30.44	33.51	43.51	71.75	100.00
1.00	40.80	40.80	40.59	40.36	40.14	39.91	255.00	255.00	255.00

Initial Supporting table - P0068_Maximum MAF f(RPM)

Description: Table of maximum MAF values vs. engine speed. This is the maximum MAF the engine can see under all ambient conditions.

Value Units: Delta MAF Values (dm)
X Unit: Engine Speed (RPM)

y/x	600.00	1,400.00	2,200.00	3,000.00	3,800.00	4,600.00	5,400.00	6,200.00	7,000.00
1.00	11.05	48.65	101.38	141.52	175.48	233.50	239.50	244.54	200.00

Initial Supporting table - P0068_Maximum MAF f(Volts)

Description: Table of maximum MAF values vs. system voltage. The output of the air meter is clamped to lower values as system voltage drops off.

Value Units: Delta MAF Values (dm)
X Unit: System Voltage (V)

y/x	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00
1.00	511.99	511.99	511.99	511.99	511.99	511.99	511.99	511.99	511.99

Initial Supporting table - P0326_P0331_AbnormalNoise_Thresh_AFM

Description: Fail threshold for the Knock Performance Abnormal Noise Diagnostic when engine IS in AFM mode

Value Units: Filtered background engine noise. Unit-less term from the Knock Detection Fast Fourier Transform (FFT) for a selected frequency range.
X Unit: Engine Speed (RPM)
Y Units: N/A

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250

Initial Supporting table - P1682 PT Relay Pull-in Run/Crank Voltage f(IAT)

Description: The Run/Crank voltages required to pull in the PT relay as a function of induction air temperature.

Value Units: Run/Crank Voltages required to pull in PT Relay (V)
X Unit: Induction Air Temperature (deg C)

y/x	23.0	85.0	95.0	105.0	125.0
1	7.000	8.700	9.000	9.200	10.000

Initial Supporting table - P16A7 PT Relay Pull-in Run/Crank Voltage f(IAT)

Description: The Run/Crank voltages required to pull in the PT relay as a function of induction air temperature.

Value Units: Run/Crank Voltages required to pull in PT Relay (V)
X Unit: Induction Air Temperature (deg C)

y/x	23.0	85.0	95.0	105.0	125.0
1	7.000	8.700	9.000	9.200	10.000

Initial Supporting table - RufCyl Decel

Description: Used for P0300-P0308. Crankshaft decel threshold during Idle or GPF regen. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: rpm
Y Units: percent load of max indicated torque (%)

RufCyl_Decel - Part 1

y/x	600	750	800	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
2	2,276	1,483	1,150	965	907	600	501	835	588	300	277	207	122
4	1,989	1,351	918	720	757	475	344	486	339	240	201	160	107
6	1,730	1,170	635	616	666	449	335	383	330	226	167	111	92
8	2,000	1,050	548	697	694	514	379	350	310	236	180	134	135
10	2,276	950	685	819	805	674	490	372	360	295	210	140	143
12	2,581	1,058	827	943	905	791	531	463	424	310	210	136	157
14	2,886	1,218	961	1,040	1,008	855	574	473	441	349	210	137	171
16	3,192	1,357	1,083	1,137	1,085	905	618	488	479	410	220	148	186
18	3,496	1,513	1,205	1,234	1,163	954	662	633	594	495	235	163	200
20	3,801	1,669	1,327	1,331	1,219	1,004	706	893	810	590	412	304	214
22	4,107	1,824	1,449	1,428	1,274	1,054	750	1,000	899	685	492	358	228
24	4,411	1,980	1,571	1,525	1,330	1,103	794	1,108	988	781	572	412	243
26	4,716	2,136	1,693	1,622	1,386	1,153	838	1,215	1,076	876	652	466	264
28	5,021	2,292	1,815	1,719	1,442	1,203	882	1,323	1,165	971	732	520	281
30	5,327	2,447	1,937	1,816	1,498	1,252	926	1,430	1,254	1,066	812	574	297
32	5,632	2,603	2,059	1,913	1,554	1,302	970	1,537	1,342	1,161	892	628	314
34	5,936	2,759	2,181	2,010	1,610	1,351	1,014	1,645	1,431	1,257	971	682	330

RufCyl_Decel - Part 2

y/x	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500
2	97	75	57	54	47	38	30	18	15	12	10	11	10
4	77	65	51	47	41	32	25	14	13	9	9	10	9
6	59	55	40	41	33	26	21	11	11	8	8	9	8
8	43	42	33	33	25	20	16	9	10	7	8	9	8
10	27	28	23	19	20	16	12	7	8	7	8	8	8
12	46	42	24	19	16	13	7	5	7	7	8	8	8
14	64	58	38	33	22	14	6	6	7	7	8	8	8
16	96	72	57	48	30	19	5	7	8	7	9	8	8
18	127	98	73	60	38	27	9	9	8	7	9	8	8
20	154	114	88	74	45	39	15	11	9	8	9	8	8
22	170	130	100	83	53	49	20	15	11	9	10	8	8

Initial Supporting table - RufCyl Decel

24	191	141	107	89	61	55	26	18	12	10	10	8	9
26	210	151	114	94	69	62	31	22	13	11	11	9	9
28	223	162	122	100	77	68	36	26	14	12	11	10	10
30	236	172	129	106	85	75	40	30	15	13	12	10	10
32	249	183	136	112	90	79	43	32	17	14	12	11	11
34	262	194	143	118	94	83	46	35	18	15	13	12	11

Initial Supporting table - RufCyl Jerk

Description: Crankshaft jerk threshold during Idle or GPF regen. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: rpm
Y Units: percent load of max indicated torque (%)

RufCyl_Jerk - Part 1

y/x	600	750	800	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
2	3,524	2,211	1,439	1,700	1,191	780	552	838	352	312	217	204	119
4	3,104	1,983	1,409	1,400	1,245	793	625	666	322	280	194	179	111
6	2,721	1,817	1,435	1,360	1,350	930	600	540	328	272	194	164	100
8	2,723	1,681	1,720	1,600	1,497	1,107	753	378	311	256	185	114	88
10	3,461	1,701	2,178	2,011	1,867	1,356	898	310	305	218	155	113	84
12	4,430	2,089	2,663	2,433	2,252	1,584	1,076	360	358	223	190	175	130
14	5,548	2,783	3,115	2,763	2,556	1,833	1,255	398	499	332	280	230	175
16	6,454	3,585	3,557	3,068	2,861	2,071	1,434	429	582	460	363	254	195
18	7,342	4,430	3,978	3,399	3,164	2,308	1,613	699	739	611	496	325	249
20	8,230	4,988	4,327	3,731	3,469	2,545	1,792	970	917	845	704	511	309
22	9,121	5,457	4,677	4,063	3,773	2,783	1,971	1,206	998	980	863	701	404
24	10,008	5,934	5,027	4,394	4,077	3,019	2,149	1,335	1,079	1,114	940	763	451
26	10,896	6,335	5,376	4,742	4,381	3,257	2,328	1,464	1,160	1,249	1,016	826	498
28	11,784	6,735	5,729	5,072	4,685	3,494	2,506	1,592	1,242	1,383	1,092	888	545
30	12,674	7,136	6,083	5,402	4,989	3,731	2,686	1,721	1,323	1,518	1,169	950	592
32	13,562	7,537	6,435	5,732	5,293	3,968	2,865	1,849	1,404	1,652	1,245	1,013	639
34	14,450	7,938	6,786	6,061	5,597	4,205	3,043	1,978	1,485	1,787	1,322	1,075	686

RufCyl_Jerk - Part 2

y/x	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500
2	108	69	53	58	46	41	30	20	20	13	9	12	11
4	96	60	48	52	38	36	23	19	16	10	7	11	10
6	81	52	42	45	36	30	17	17	14	9	7	10	9
8	67	43	39	41	32	23	13	15	13	10	8	9	8
10	57	32	36	37	31	19	11	15	12	11	9	8	8
12	82	46	44	40	28	17	11	15	13	12	10	8	8
14	124	69	65	54	33	26	11	18	13	14	12	9	9
16	175	107	90	74	41	42	10	22	14	16	14	11	10
18	227	144	113	99	59	57	15	28	18	17	15	13	11
20	262	181	138	126	84	73	26	32	23	18	16	14	12
22	296	220	158	153	104	82	38	35	28	19	18	15	13

Initial Supporting table - RufCyl Jerk

24	331	249	179	176	126	90	49	39	31	21	19	16	14
26	365	280	200	195	144	98	61	43	34	23	21	18	16
28	400	304	220	209	154	107	69	48	37	25	22	19	17
30	434	328	239	222	164	115	77	52	40	26	24	21	18
32	469	352	254	235	173	123	82	56	43	28	25	22	19
34	503	376	269	248	183	131	87	60	45	30	27	24	21

Initial Supporting table - RufSCD Decel

Description: Used for P0300-P0308. Crankshaft decel threshold while in SCD mode during Idle or GPF regen. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load. Note: Misfire's Load term is %, but not PID$04. PID $04 is not robust to temperature and alititude shifts, (especially decel and jerk thresholds since they track actual air trapped in cylinder)

Value Units: Delta time per cylinder (usee)
X Unit: rpm
Y Units: percent load of max indicated torque (%)

RufSCD_Decel - Part 1

y/x	600	750	800	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
2	1,290	396	309	250	226	157	152	101	141	85	65	41	26
4	1,290	396	309	250	226	157	152	101	126	82	58	41	26
6	1,346	435	347	279	249	171	162	108	110	84	55	44	28
8	1,474	513	428	342	300	207	181	125	104	92	59	52	32
10	1,634	563	502	412	357	270	193	143	119	97	65	61	37
12	1,793	614	580	487	414	332	215	160	136	102	58	60	41
14	1,953	666	657	562	470	394	236	178	153	111	58	64	42
16	2,113	717	734	638	527	457	257	197	171	118	63	69	41
18	2,272	768	812	713	584	519	279	219	189	119	70	67	39
20	2,432	819	889	789	641	582	301	251	207	124	72	64	41
22	2,591	870	967	865	698	635	323	276	224	130	70	64	43
24	2,751	921	1,044	940	754	693	344	300	242	134	69	65	45
26	2,911	971	1,121	1,016	811	755	366	323	260	137	70	68	47
28	3,070	1,022	1,198	1,091	868	817	387	347	277	142	75	73	49
30	3,230	1,074	1,276	1,167	924	880	409	371	295	151	80	76	52
32	3,389	1,125	1,353	1,243	981	942	431	395	312	157	88	79	54
34	3,549	1,176	1,431	1,318	1,038	1,004	452	419	330	163	94	82	56

RufSCD_Decel - Part 2

y/x	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500
2	20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
4	20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	23	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	27	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	28	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - RufSCD Decel

20	30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	31	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	34	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
28	35	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	36	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
32	38	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
34	39	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - RufSCD Jerk

Description: Used for P0300-P0308. Crankshaft jerk threshold while in SCD mode during Idle or GPF regen. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Value Units: Delta time per cylinder (usee)
X Unit: rpm
Y Units: percent load of max indicated torque (%)

RufSCD_Jerk - Part 1

y/x	600	750	800	850	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800
2	1,328	591	391	299	266	214	145	120	81	64	61	67	49
4	1,328	591	391	299	266	214	145	120	81	64	59	64	46
6	1,419	620	406	309	280	219	149	126	81	67	61	64	45
8	1,602	682	437	329	308	229	158	140	84	72	69	70	47
10	1,739	743	471	351	335	239	166	155	91	79	80	75	50
12	1,876	805	505	371	362	249	175	170	98	86	84	77	53
14	2,012	866	539	392	388	260	184	185	105	105	90	83	56
16	2,149	928	574	412	415	270	192	200	113	118	97	91	59
18	2,286	990	608	433	441	280	201	215	120	116	102	96	61
20	2,423	1,051	641	454	469	290	210	230	127	131	105	99	61
22	2,560	1,113	676	475	495	301	218	244	134	140	107	99	61
24	2,696	1,175	710	496	522	311	226	259	141	143	108	99	62
26	2,824	1,237	744	516	550	321	235	274	148	148	109	102	64
28	2,936	1,298	778	537	576	331	244	289	156	160	109	106	67
30	3,077	1,360	813	558	603	342	253	304	163	166	113	111	71
32	3,218	1,421	847	579	630	352	261	319	171	173	116	117	74
34	3,359	1,483	881	599	657	362	269	334	178	182	120	124	77

RufSCD_Jerk - Part 2

y/x	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500
2	14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
4	14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	11	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	7	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	11	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	11	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	15	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - RufSCD Jerk

22	15	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	15	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
28	17	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	15	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
32	15	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
34	15	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - Misfire_IMEP_BinID_Load_Axis

Description: Cylinder LOAD for defining Y AXIS in Misfire_IMEP_BinID_versus_Speed_and_Load

Value Units: Indicated Mean Effective Pressure
X Unit: Bin ID row number

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	50	125	175	225	275	325	375	425	475	525	600	700	825	975	1,175	1,425	1,675

Initial Supporting table - Misfire_IMEP_BinID_RPM_Axis

Description: Cylinder RPM for defining the X AXIS in Misfire_IMEP_BinID_versus_Speed_and_Load

Value Units: RPM
X Unit: BinID Column number

y/x	1	2	3	4	5	6	7	8	9
1	775	1,075	1,325	1,575	1,825	2,075	2,325	2,575	2,825

Initial Supporting table - Misfire_IMEP_BinID_vs_RPM_Load

Description: Misfire calibrations used with Crankshaft Based IMEP (Indicated Mean Effective Pressure) estimatimation do not interpolate versus speed and load. Instead they use unique calibrations within each small speed load "bin". Each Bin has has its own "bin ID". This Bin ID keeps all the Crank Based IMEP estimate calculations and various Misfire calibrations synchronized while minimzing through put. Each speed load range defines a unique "Bin ID" in this Bin ID table. The BinID tables Y axis is cylinder load, and X axis is rpm as defined in Misfire_IMEP_BinID_Load_Axis and Misfire_IMEP_BinID_RPM_Axis tables

Value Units: Bin ID
X Unit: RPM range
Y Units: Cylinder Load Range

y/x	0	1	2	3	4	5	6	7	8
0	0	17	34	51	68	85	102	119	136
1	1	18	35	52	69	86	103	120	137
2	2	19	36	53	70	87	104	121	138
3	3	20	37	54	71	88	105	122	139
4	4	21	38	55	72	89	106	123	140
5	5	22	39	56	73	90	107	124	141
6	6	23	40	57	74	91	108	125	142
7	7	24	41	58	75	92	109	126	143
8	8	25	42	59	76	93	110	127	144
9	9	26	43	60	77	94	111	128	145
10	10	27	44	61	78	95	112	129	146
11	11	28	45	62	79	96	113	130	147
12	12	29	46	63	80	97	114	131	148
13	13	30	47	64	81	98	115	132	149
14	14	31	48	65	82	99	116	133	150
15	15	32	49	66	83	100	117	134	151
16	16	33	50	67	84	101	118	135	152

Initial Supporting table - Misfire_IMEP_Thresh_vs_BinID

Description: Crankshaft Indicated Mean Effective Pressure (IMEP) Estimate that below which will be considered misfire. Misfire calibrations used with Crankshaft Based IMEP (Indicated Mean Effective Pressure) estimatimation do not interpolate versus speed and load. Instead they use unique calibrations within each small speed load region or "bin". Each Bin has has its own "BinID". This BinID keeps all the Crank Based IMEP estimate calculations and various Misfire calibrations synchronized while minimzing through put. Each speed load range defines a unique "Bin ID" in this Bin ID table.
The BinID table's Y axis is cylinder load, and X axis is rpm as defined in Misfire_IMEP_BinID_Load_Axis and Misfire_IMEP_BinID_RPM_Axis tables

Value Units: KPa
XUnit: BinID

Misfire_IMEP_Thresh_vs_BinID - Part 1

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 2

y/x	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 3

y/x	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 4

y/x	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 5

y/x	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 6

y/x	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 7

y/x	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 8

y/x	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 9

y/x	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152

Initial Supporting table - Misfire_IMEP_Thresh_vs_BinID

1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - Misfire_IMEP_BinID_Load_Axis

Description: Cylinder LOAD for defining Y AXIS in Misfire_IMEP_BinID_versus_Speed_and_Load

Value Units: Indicated Mean Effective Pressure
X Unit: Bin ID row number

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	50	125	175	225	275	325	375	425	475	525	600	700	825	975	1,175	1,425	1,675

Initial Supporting table - Misfire_IMEP_BinID_RPM_Axis

Description: Cylinder RPM for defining the X AXIS in Misfire_IMEP_BinID_versus_Speed_and_Load

Value Units: RPM
X Unit: BinID Column number

y/x	1	2	3	4	5	6	7	8	9
1	775	1,075	1,325	1,575	1,825	2,075	2,325	2,575	2,825

Initial Supporting table - Misfire_IMEP_BinID_vs_RPM_Load

Description: Misfire calibrations used with Crankshaft Based IMEP (Indicated Mean Effective Pressure) estimatimation do not interpolate versus speed and load. Instead they use unique calibrations within each small speed load "bin". Each Bin has has its own "bin ID". This Bin ID keeps all the Crank Based IMEP estimate calculations and various Misfire calibrations synchronized while minimzing through put. Each speed load range defines a unique "Bin ID" in this Bin ID table. The BinID tables Y axis is cylinder load, and X axis is rpm as defined in Misfire_IMEP_BinID_Load_Axis and Misfire_IMEP_BinID_RPM_Axis tables

Value Units: Bin ID
X Unit: RPM range
Y Units: Cylinder Load Range

y/x	0	1	2	3	4	5	6	7	8
0	0	17	34	51	68	85	102	119	136
1	1	18	35	52	69	86	103	120	137
2	2	19	36	53	70	87	104	121	138
3	3	20	37	54	71	88	105	122	139
4	4	21	38	55	72	89	106	123	140
5	5	22	39	56	73	90	107	124	141
6	6	23	40	57	74	91	108	125	142
7	7	24	41	58	75	92	109	126	143
8	8	25	42	59	76	93	110	127	144
9	9	26	43	60	77	94	111	128	145
10	10	27	44	61	78	95	112	129	146
11	11	28	45	62	79	96	113	130	147
12	12	29	46	63	80	97	114	131	148
13	13	30	47	64	81	98	115	132	149
14	14	31	48	65	82	99	116	133	150
15	15	32	49	66	83	100	117	134	151
16	16	33	50	67	84	101	118	135	152

Initial Supporting table - Misfire_IMEP_Thresh_vs_BinID

Description: Crankshaft Indicated Mean Effective Pressure (IMEP) Estimate that below which i will be considered misfire. Misfire calibrations used with Crankshaft Based IMEP (Indicated Mean Effective Pressure) estimatimation do not interpolate versus speed and load. Instead they use unique calibrations within each small speed load region or "bin". Each Bin has has its own "BinID". This BinID keeps all the Crank Based IMEP estimate calculations and various Misfire calibrations synchronized while minimzing through put. Each speed load range defines a unique "Bin ID" in this Bin ID table.
The BinID table's Y axis is cylinder load, and X axis is rpm as defined in Misfire_IMEP_BinID_Load_Axis and Misfire_IMEP_BinID_RPM_Axis tables

Value Units: KPa
XUnit: BinID

Misfire_IMEP_Thresh_vs_BinID - Part 1

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 2

y/x	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 3

y/x	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 4

y/x	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 5

y/x	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 6

y/x	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 7

y/x	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 8

y/x	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Misfire_IMEP_Thresh_vs_BinID - Part 9

y/x	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152

Initial Supporting table - Misfire_IMEP_Thresh_vs_BinID

1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - P0191 - High fail limit of fuel control due to high pressure sensor skewed High

Description: High fail limit of fuel control due to high pressure sensor skewed High error as Function of desired pressure

Value Units: Ratio
X Unit: Desired Pressure (Mpa)

y/x	0.00	4.00	8.00	12.00	16.00	20.00	24.00	28.00	32.00
1.00	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20

Initial Supporting table - P0191 - Low fail limit of fuel control due to pressure sensor skewed low

Description: Low fail limit of fuel control due to pressure sensor skewed low error as Function of desired pressure

Value Units: Ratio
X Unit: Desired Pressure (Mpa)

y/x	0.00	4.00	8.00	12.00	16.00	20.00	24.00	28.00	32.00
1.00	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

Initial Supporting table - P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Closing Time

Description: Maximum injector closing time function of measured fuel rail pressure

Value Units: Injector Closing Time (us)
X Unit: Measrured Fuel Rail Pressure (MPa)

y/x	0.40	4.00	5.00	6.00	10.00	15.00	17.00	20.00	22.00	25.00	27.00	29.00	31.00	34.00	35.00	36.00	38.00
1.00	237	182	174	173	161	129	121	112	110	104	98	98	93	83	81	78	75

Initial Supporting table - P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Maximum Injector Opening Magnitude

Description: Maximum injector opening Magnitude voltage function of measured fuel rail pressure

Value Units: Opening Magnitude Voltage
X Unit: Measrured Fuel Rail Pressure (MPa)

y/x	0.40	4.00	5.00	6.00	10.00	15.00	17.00	20.00	22.00	25.00	27.00	29.00	31.00	34.00	35.00	36.00	38.00
1.00	787	783	782	785	793	795	795	800	803	813	808	817	817	815	818	823	832

Initial Supporting table - P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Closing Time

Description: Minimum injector closing time function of measured fuel rail pressure

Value Units: Injector Closing Time (us)
X Unit: Measrured Fuel Rail Pressure (MPa)

y/x	0.40	4.00	5.00	6.00	10.00	15.00	17.00	20.00	22.00	25.00	27.00	29.00	31.00	34.00	35.00	36.00	38.00
1.00	237	182	174	173	161	129	121	112	110	104	98	98	93	83	81	78	75

Initial Supporting table - P02EE P02EF P02F0 P02F1 P02F2 P02F3 P02F4 P02F5 P30D4 - Minimum Injector Opening Magnitude

Description: Minimum injector opening Magnitude voltage function of measured fuel rail pressure

Value Units: Opening Magnitude Voltage
X Unit: Measrured Fuel Rail Pressure (MPa)

y/x	0.40	4.00	5.00	6.00	10.00	15.00	17.00	20.00	22.00	25.00	27.00	29.00	31.00	34.00	35.00	36.00	38.00
1.00	187	183	182	185	193	195	195	200	203	213	208	217	217	215	218	223	232

Initial Supporting table - P02EE P02EF P02F0 P02F1P30D4 - Voltage Feedback Rationalities Minimum Pulse Width

Description: Minimum injection pulse width function of measured fuel rail pressure where the voltage feedback measured from the analog to digital converter is rationalized

Value Units: Pulse Width (ms)
X Unit: Measrured Fuel Rail Pressure (MPa)

y/x	0.40	4.00	5.00	6.00	10.00	15.00	17.00	20.00	22.00	25.00	27.00	29.00	31.00	34.00	35.00	36.00	38.00
1.00	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Initial Supporting table - P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit

Description: Minimum Small Pulse Compensation Fail Limit function of Pulse Width and Pressure

Value Units: Minimum Small Pulse Compensation Fail Limit (ms)
X Unit: Measrured Fuel Rail Pressure (MPa)
Y Units: Injection Pulse With (ms)

P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit - Part 1

y/x	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.04
0.40	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
4.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
5.00	-0.18	-0.18	-0.19	-0.19	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
6.00	-0.16	-0.16	-0.16	-0.17	-0.17	-0.17	-0.18	-0.18	-0.19	-0.19	-0.20
10.00	-0.12	-0.12	-0.13	-0.13	-0.13	-0.14	-0.14	-0.15	-0.15	-0.15	-0.16
15.00	-0.09	-0.10	-0.10	-0.11	-0.11	-0.11	-0.12	-0.12	-0.13	-0.13	-0.13
17.00	-0.08	-0.08	-0.09	-0.09	-0.09	-0.10	-0.10	-0.11	-0.11	-0.11	-0.12
20.00	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07	-0.08	-0.08	-0.08	-0.09	-0.09
22.00	-0.03	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07	-0.07
25.00	-0.03	-0.03	-0.04	-0.04	-0.05	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07
27.00	-0.03	-0.03	-0.04	-0.04	-0.05	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07
29.00	-0.03	-0.03	-0.04	-0.04	-0.05	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07
31.00	-0.03	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07	-0.07
34.00	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.06	-0.06	-0.07	-0.07	-0.08
35.00	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.06	-0.06	-0.07	-0.07	-0.08
36.00	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.06	-0.06	-0.07	-0.07	-0.08
38.00	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06	-0.06	-0.07	-0.07	-0.07	-0.08

P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit - Part 2

y/x	0.04	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.10
0.40	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
4.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
5.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
6.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
10.00	-0.16	-0.16	-0.17	-0.17	-0.18	-0.18	-0.18	-0.19	-0.19	-0.20	-0.20
15.00	-0.14	-0.14	-0.15	-0.15	-0.15	-0.16	-0.16	-0.17	-0.17	-0.17	-0.19
17.00	-0.12	-0.13	-0.13	-0.13	-0.14	-0.14	-0.15	-0.15	-0.15	-0.16	-0.18
20.00	-0.09	-0.10	-0.10	-0.11	-0.11	-0.11	-0.12	-0.12	-0.13	-0.13	-0.15
22.00	-0.08	-0.08	-0.09	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.11	-0.13
25.00	-0.07	-0.08	-0.08	-0.09	-0.09	-0.09	-0.10	-0.10	-0.11	-0.11	-0.13
27.00	-0.07	-0.08	-0.08	-0.09	-0.09	-0.09	-0.10	-0.10	-0.11	-0.11	-0.13

Initial Supporting table - P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit

29.00	-0.07	-0.08	-0.08	-0.09	-0.09	-0.09	-0.10	-0.10	-0.11	-0.11	-0.13
31.00	-0.08	-0.08	-0.09	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.11	-0.13
34.00	-0.08	-0.08	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.11	-0.12	-0.14
35.00	-0.08	-0.08	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.11	-0.12	-0.14
36.00	-0.08	-0.08	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.11	-0.12	-0.14
38.00	-0.08	-0.09	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.11	-0.12	-0.14

P10A3 P10A5 P10A7 P10A9 P10AB P10AD P10AF P10B1 - Minimum Small Pulse Compensation Limit - Part 3

y/x	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	1.00	1.50
0.40	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
4.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
5.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
6.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
10.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
15.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
17.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
20.00	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
22.00	-0.18	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
25.00	-0.18	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
27.00	-0.18	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
29.00	-0.18	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
31.00	-0.18	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
34.00	-0.19	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
35.00	-0.19	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
36.00	-0.19	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
38.00	-0.19	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20

Initial Supporting table - P10A4 P10A6 P10A8 P10AA P10AC P10AE P10B0 P10B2 - Maximum Small Pulse Compensation Limit

Description: Maximum Small Pulse Compensation Fail Limit function of Pulse Width and Pressure

Value Units: Maximum Small Pulse Compensation Fail Limit (ms)
X Unit: Measrured Fuel Rail Pressure (MPa)
Y Units: Injection Pulse With (ms)

P10A4 P10A6 P10A8 P10AA P10AC P10AE P10B0 P10B2 - Maximum Small Pulse Compensation Limit - Part 1

y/x	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.04
0.40	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
4.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
5.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
6.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
10.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
17.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
20.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
25.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
27.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
29.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
31.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
34.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
35.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
36.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
38.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

P10A4 P10A6 P10A8 P10AA P10AC P10AE P10B0 P10B2 - Maximum Small Pulse Compensation Limit - Part 2

y/x	0.04	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.10
0.40	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
4.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
5.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
6.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
10.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
17.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
20.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
25.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
27.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

Initial Supporting table - P10A4 P10A6 P10A8 P10AA P10AC P10AE P10B0 P10B2 - Maximum Small Pulse Compensation Limit

29.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
31.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
34.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
35.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
36.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
38.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
P10A4 P10A6 P10A8 P10AA P10AC P10AE P10B0 P10B2 - Maximum Small Pulse Compensation Limit - Part 3											
y/x	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	1.00	1.50
0.40	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
4.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
5.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
6.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
10.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
17.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
20.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
25.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
27.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
29.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
31.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
34.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
35.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
36.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
38.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

Initial Supporting table - P228C P2C1F - High Pressure Pump Control (HPC) fail threshold of pressure too low

Description: The High Pressure Pump Control (HPC) fail threshold of pressure too low test as a function of desired fuel pressure.

Value Units: Pressure Error - Desired pressure - Actual Pressure (Mpa)
X Unit: Desired Pressure (Mpa)

y/x	0	4	8	12	16	20	24	28	32
1	0	3	3	3	3	3	3	3	3

Initial Supporting table - P228D P2C20 - High Pressure Pump Control (HPC) fail threshold for pressure too high

Description: The High Pressure Pump Control (HPC) fail threshold for pressure too high test as a function of desired fuel pressure.

Value Units: Pressure Error - Desired pressure - Actual Pressure (Mpa)
X Unit: Desired Pressure (Mpa)

y/x	0.00	4.00	8.00	12.00	16.00	20.00	24.00	28.00	32.00
1	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00

al Supporting table - P2B00 P2B01 P2B02 P2B03 P2B96 P2B08 P2B09 P2B0A P2B0B- Opening Magnitude 2 Delta Misisng Pulse Fail Lirrit

Description: Opening Magnitude 2 Delta threshold to detect missing injection pulse

Value Units: Opening Magnitude 2 Delta Voltage
X Unit: Measured Fuel Rail Pressure

y/x	0.40	4.00	5.00	6.00	10.00	15.00	17.00	20.00	22.00	25.00	27.00	29.00	31.00	34.00	35.00	36.00	38.00
1.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00

nitial Supporting table - P2B00 P2B01 P2B02 P2B03 P2B96 P2B08 P2B09 P2B0A P2B0B- Opening Magnitude 2 Misisng Pulse Fail Limit

Description: Opening Magnitude 2 threshold to detect missing injection pulse

Value Units: Opening Magnitude 2 Voltage
X Unit: Measured Fuel Rail Pressure

y/x	0.40	4.00	5.00	6.00	10.00	15.00	17.00	20.00	22.00	25.00	27.00	29.00	31.00	34.00	35.00	36.00	38.00
1.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00

Initial Supporting table - P2B00 P2B01 P2B02 P2B03 P2B96 P2B08 P2B09 P2B0A P2B0B- Opening Magnitude Misisng Pulse Fail Limit

Description: Opening Magnitude threshold to detect missing injection pulse

Value Units: Opening Magnitude Voltage
X Unit: Measured Fuel Rail Pressure

y/x	0.40	4.00	5.00	6.00	10.00	15.00	17.00	20.00	22.00	25.00	27.00	29.00	31.00	34.00	35.00	36.00	38.00
1.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00

Initial Supporting table - P04FB : Pressure Sensor Equilibrium Time

Description: Pressure sensor equilibrium time funtion of Outside Ambient Temperature

Value Units: Time (seconds)
X Unit: Outside Ambient Temperature (degrees C)

y/x	-40	-30	-20	-10	0	30	40
1	10	10	10	10	10	10	10

Initial Supporting table - P0324_PerCyl_ExcessiveKnock_Threshold

Description: Fail threshold for the Knock Performance per-cylinder Excessive Knock Diagnostic

Value Units: Filtered Knock Intensity. Unit-less term scaled from 0.0 (no knock) to 5.0 (maximum/large knock)
X Unit: Engine Speed (RPM)
Y Units: N/A

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50

Initial Supporting table - P0325_P0330_OpenCktThrshMax (20 kHz)

Description: Knock Open Circuit Diagnostic Maximum Threshold when using the 20 kHz method (see "OpenMethod" description)

Value Units: Unit-less, filtered term from the Knock Detection Fast Fourier Transform (FFT) for the 20 kHz frequency range.
X Unit: Engine Speed (RPM).
Y Units: N/A

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	7.7676	7.7578	7.7520	7.7539	7.7480	7.7441	7.7598	7.7813	7.7949	7.5918	6.9824	6.5996	6.2148	6.2148	6.2148	6.2148	6.2148

Initial Supporting table - P0325_P0330_OpenCktThrshMax (Normal Noise)

Description: Knock Open Circuit Diagnostic Minimum Threshold when using the Normal Noise method (see "OpenMethod" description): When using the Normal Noise method (see "OpenMethod" description).

Value Units: Filtered background engine noise. Unit-less term from the Knock Detection Fast Fourier Transform (FFT) for a selected frequency range.
X Unit: Engine Speed (RPM)
Y Units: N/A

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	1.5000	1.5000	1.5000	1.4004	1.1992	0.8496	0.7109	0.6191	0.4805	0.4805	0.4805	0.4805	0.4805	0.4805	0.4805	0.4805	0.4805

Initial Supporting table - P0325_P0330_OpenCktThrshMin (20 kHz)

Description: Knock Open Circuit Diagnostic Minimum Threshold when using the 20 kHz method (see "OpenMethod" description)

Value Units: Unit-less, filtered term from the Knock Detection Fast Fourier Transform (FFT) for the 20 kHz frequency range.
X Unit: Engine (RPM)
Y Units: N/A

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5996	2.6992	2.6992	2.6992	2.6992	2.6992	2.6992	2.6992	2.6992	2.6992

Initial Supporting table - P0325_P0330_OpenCktThrshMin (Normal Noise)

Description: Knock Open Circuit Diagnostic Minimum Threshold when using the Normal Noise method (see "OpenMethod" description): When using the Normal Noise method (see "OpenMethod" description).

Value Units: Filtered background engine noise. Unit-less term from the Knock Detection Fast Fourier Transform (FFT) for a selected frequency range.
X Unit: Engine Speed (RPM)
Y Units: N/A

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.2441	0.1855	0.1191	0.1270	0.0781	0.0527	0.0371	0.0254	0.0195	0.0449	0.0469	0.0430	0.0000	0.0000	0.0000	0.0000	0.0000

Initial Supporting table - P032!5_P0330_OpenMethod_2

Description: Defines which Knock Open Circuit Diagnostic method to use.

Value Units: Identifies one of two diagnostic methods (either 20 kHz or Normal Noise) used (as a function of engine speed) for Open Circuit detection
X Unit: Engine Speed Index, 500 to 8500 (RPM) by 500 rpm increments (Index 0, 1, 2.... 16 = 500, 1000, 1500.... 8500 RPM)
Y Units: N/A

P0325_P0330_OpenMethod_2 - Part 1					
y/x	0	1	2	3	4
1	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz
P0325_P0330_OpenMethod_2 - Part 2					
y/x	5	6	7	8	9
1	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_UseExact RPM	CeKNKD_e_Open_NormalNoise
P0325_P0330_OpenMethod_2 - Part 3					
y/x	10	11	12	13	14
1	CeKNKD_e_Open_NormalNoise	CeKNKD_e_Open_NormalNoise	CeKNKD_e_Open_NormalNoise	CeKNKD_e_Open_NormalNoise	CeKNKD_e_Open_NormalNoise
P0325_P0330_OpenMethod_2 - Part 4					
y/x	15	16			
1	CeKNKD_e_Open_NormalNoise	CeKNKD_e_Open_NormalNoise			

Initial Supporting table - P0326_P0331_AbnormalNoise_CylsEnabled

Description: Specifies which cylinders will be used for the Abnormal Noise portion of the performance diagnostics (1 = cylinder used, 0 = cylinder not used)

Value Units: Boolean that indicates which engine cylinders are being used for the per-sensor Knock Performance diagnostic (0 = not used, 1 = used)
X Unit: Cylinder number in firing order (i.e. Cyl 0 = first cylinder in firing order, Cyl 1 = second cylinder in firing order....)
Y Units: N/A

y/x	0	1	2	3	4	5	6	7
1	1	1	1	1	0	0	0	0

Initial Supporting table - P0326_P0331_AbnormalNoise_Threshold

Description: Fail threshold for the Knock Performance Abnormal Noise Diagnostic when engine is NOT in AFM mode

Value Units: Filtered background engine noise. Unit-less term from the Knock Detection Fast Fourier Transform (FFT) for a selected frequency range.
X Unit: Engine Speed (RPM)
Y Units: N/A

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250

Initial Supporting table - P06B6_P06B7_OpenTestCktThrshMax

Description: Knock Open Circuit Minimum Threshold for Internal Circuit Diagnostic. Used only when the 20 kHz method is being used (see "OpenMethod" description). The Open Test Circuit ensures that the internal circuit used to generate the 20 kHz signal for the Open Circuit diags (P0325, P0330) is within range.

Value Units: Unit-less, filtered term from the Knock Detection Fast Fourier Transform (FFT) for the 20 kHz frequency range.
X Unit: Engine Speed (RPM)
Y Units: N/A

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.100	0.100	0.133	0.205	0.236	0.309	0.432	0.551	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600

Initial Supporting table - P06B6_P06B7_OpenTestCktThrshMin

Description: Knock Open Circuit Minimum Threshold for Internal Circuit Diagnostic. Used only when the 20 kHz method is being used (see "OpenMethod" description). The Open Test Circuit ensures that the internal circuit used to generate the 20 kHz signal for the Open Circuit diags (P0325, P0330) is within range.

Value Units: Unit-less, filtered term from the Knock Detection Fast Fourier Transform (FFT) for the 20 kHz frequency range.
X Unit: Engine Speed (RPM).
Y Units: N/A

y/x	750	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.010	0.020	0.051	0.063	0.072	0.100	0.125	0.201	0.250	0.301	0.449	0.625	0.625	0.625	0.625	0.625	0.625

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
GPS Signal Not Plausible	B1B44	Monitors if the recieved GPS location is plausible. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and or SuperCruise will occur.	The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have be satisfied AND The values within the Redundant GPS Array do not exactly match a sample within the Primary GPS Array	If the primary measurement for the following signals do not match the redundant version of these below signals: -Lower Global Time Stamp -Heading -Elevation -Longitude -Latitude -Signal Acquisition Time -Calendar Year -Calendar Day -Time of Day -Mode -2D Absolute Position Error Estimate -Absolute Heading Error Estimate -Location Usable	Primary Precise Positioning System Data Group Communication Fault Active Redundant Precise Positioning System Data Burst Group Communication Fault Active Primary Precise Positioning System Data Group Data Recieved value changed from the previous excecution cycle Diagnostic System Disabled is FALSE Vehicle Power Mode K_Integrity_Diagnostic_Enable is TRUE	= FALSE = FALSE = FALSE = ACCESSORY, RUN or PROPULSION = TRUE	Continous	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
GPS Signal - Vehicle Speed not Plausible	B1B46	Monitors if the recieved GPS speed is plausible. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and or SuperCruise will occur.	The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have be satisfied AND There is a difference between the host vehicle GNSS calculated vehicle speed, and the vehicle speed calculated via the vehicle wheel speed sensors	abs(host vehicle GNSS calculated vehicle speed - the vehicle speed calculated via the vehicle wheel speed sensors) > K_LimitThreahold	Diagnostic System Disabled Vehicle Power Mode Primary Precise Positioning System Mode Primary Precise Positioning System Location Usable Primary Precise Positioning System Data Group Communication Fault Active Primary Precise Positioning System Data Group Data Recieved GPS Time Drift Diagnostic Fault Active GPS Integrity Diagnostic Fault Active Host Vehicle Velocity Invalidity Host Vehicle Yaw Rate Invalidity is FALSE	= FALSE = ACCESSORY, RUN or PROPULSION = GNSS and RTX and DR, or GNSS and RTX and DR and MM = TRUE = FALSE = TRUE = FALSE = FALSE = FALSE = FALSE	Continous	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lateral Acceleration Sensor	C0061	Monitors for faults of the High Performance IMU Upon fault detection the emissions neutral default action action of disabling adaptive cruise and or SuperCruise will occur.	The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have been satisfied AND HP IMU Lateral Acceleration Correlation Status is Unknown or Not Correlated	HP IMU Lateral Acceleration Correlation Status is Unknown or Not Correlated	K_Communications_Fault _Pending HP IMU Lateral Acceleration Correlation Status Loss of Communication Fault Active HP IMU Lateral Acceleration Correlation Status Failed Safety Fault Active HP IMU Lateral Acceleration Correlation Status Availability Indication HP IMU Lateral Acceleration Correlation Status Failed Safety Indication HP IMU Common Diagnostic Enable Lateral Acceleration Correlation Diagnostic Communication Enable HP IMU Signal Diagnostic Enable Manufactures Enable Counter (MEC) K_Lateral_Acceleration_D iagnostic_Enable	= FALSE = FALSE = FALSE = Available = FALSE = TRUE = TRUE = TRUE = 0 =TRUE	Continous	Type D, 1 Trip No SDA Safety END
			The diagnostic sub function shall record a	■HPIMU Primary Lateral Acceleration	K_Communications_Fault -Pending	= FALSE	Continous	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			failure if all of the following conditions are met: The Enable Criteria have been satisfied AND any of the following are True: ■HPIMU Primary Lateral Acceleration Invalidity is Determined Invalid ■HPIMU Secondary Lateral Acceleration Invalidity is Determined Invalid	Invalidity is Determined Invalid OR HP IMU Secondary Lateral Acceleration Invalidity is Determined Invalid	HP IMU Primary Lateral Acceleration Loss of Communication Fault Active HP IMU Primary Lateral Acceleration Availability Indication HP IMU Primary Lateral Acceleration Failed Safety Fault Active HP IMU Primary Lateral Acceleration Failed Safety Indication HP IMU Secondary Lateral Acceleration Loss of Communication Fault Active HP IMU Secondary Lateral Acceleration Availability Indication HP IMU Secondary Lateral Acceleration Failed Safety Fault Active HP IMU Secondary Lateral Acceleration Failed Safety Indication HP IMU Common Diagnostic Enable HP IMU Signal Diagnostic Enable Lateral Acceleration	= FALSE = Available = FALSE = FALSE = FALSE =Available = FALSE = FALSE =TRUE =TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Invalid Diagnostic Communication Enable Manufactures Enable Counter (MEC) K_Lateral_Acceleration_Diagnostic_Enable	=TRUE =0 =TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Longitudinal Acceleration Sensor	C0062	Monitors for faults of the High Performance IMU Upon fault detection the emissions neutral default action action of disabling adaptive cruise and or SuperCruise will occur.	The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have been satisfied AND HP IMU Longitudinal Acceleration Correlation Status is Unknown or Not Correlated	HP IMU Longitudinal Acceleration Correlation Status is Unknown or Not Correlated	K_Communications_Fault _Pending HP IMU Longitudinal Acceleration Correlation Status Loss of Communication Fault Active HP IMU Longitudinal Acceleration Correlation Status Failed Safety Fault Active HP IMU Longitudinal Acceleration Correlation Status Availability Indication HP IMU Longitudinal Acceleration Correlation Status Failed Safety Indication HP IMU Common Diagnostic Enable Longitudinal Acceleration Correlation Diagnostic Communication Enable HP IMU Signal Diagnostic Enable Manufactures Enable Counter (MEC) K_Longitudinal _Acceleration_Diagnostic -Enable	= FALSE = FALSE = FALSE = Available = FALSE = TRUE = TRUE = TRUE = 0 =TRUE	Continous	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have been satisfied AND any of the following are True: ■HPIMU Primary Longitudinal Acceleration Invalidity is Determined Invalid ■HPIMU Secondary Longitudinal Acceleration Invalidity is Determined Invalid	■HPIMU Primary Longitudinal Acceleration Invalidity is Determined Invalid OR HP IMU Secondary Longitudinal Acceleration Invalidity is Determined Invalid	K_Communications_Fault _Pending HP IMU Primary Longitudinal Acceleration Loss of Communication Fault Active HP IMU Primary Longitudinal Acceleration Availability Indication HP IMU Primary Longitudinal Acceleration Failed Safety Fault Active HP IMU Primary Longitudinal Acceleration Failed Safety Indication HP IMU Secondary Longitudinal Acceleration Loss of Communication Fault Active HP IMU Secondary Longitudinal Acceleration Availability Indication HP IMU Secondary Longitudinal Acceleration Failed Safety Fault Active HP IMU Secondary Longitudinal Acceleration Failed Safety Indication HP IMU Common Diagnostic Enable HP IMU Signal Diagnostic Enable	= FALSE = FALSE = Available = FALSE = FALSE = FALSE =Available = FALSE = FALSE =TRUE TRUE	Continous	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Longitudinal Acceleration Invalid Diagnostic Communication Enable Manufactures Enable Counter (MEC) K_Longitudinal _Acceleration_Diagnostic _Enable	=TRUE =0 =TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Yaw Rate Sensor	C0063	Monitors for faults of the High Performance IMU Upon fault detection the emissions neutral default action action of disabling adaptive cruise and or SuperCruise will occur.	The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have been satisfied AND HP IMU Yaw Rate Correlation Status is Unknown or Not Correlated	HP IMU]Yaw Rate Correlation Status is Unknown or Not Correlated	K_Communications_Fault _Pending HP IMU Yaw Rate Correlation Status Loss of Communication Fault Active HP IMU Yaw Rate Correlation Status Failed Safety Fault Active HP IMU Yaw Rate Correlation Status Availability Indication HP IMU Yaw Rate Correlation Status Failed Safety Indication HP IMU Common Diagnostic Enable Yaw Rate Correlation Diagnostic Communication Enable HP IMU Signal Diagnostic Enable Manufactures Enable Counter (MEC) K_Yaw_Rate_Diagnostic_ Enable	= FALSE = FALSE = FALSE = Available = FALSE = TRUE = TRUE = TRUE = 0 =TRUE	Continous	Type D, 1 Trip No SDA Safety END
			The diagnostic sub function shall record a	■HPIMU Primary Yaw Rate Invalidity is	K_Communications_Fault -Pending	= FALSE	Continous	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			failure if all of the following conditions are met: The Enable Criteria have been satisfied AND any of the following are True: ■HPIMU Primary Yaw Rate Invalidity is Determined Invalid ■HPIMU Secondary Yaw Rate Invalidity is Determined Invalid	Determined Invalid OR HP IMU Secondary Yaw Rate Invalidity is Determined Invalid	HP IMU Primary Yaw Rate Loss of Communication Fault Active HP IMU Primary Yaw Rate Availability Indication HP IMU Primary Yaw Rate Failed Safety Fault Active HP IMU Primary Yaw Rate Failed Safety Indication HP IMU Secondary Yaw Rate Loss of Communication Fault Active HP IMU Secondary Yaw Rate Availability Indication HP IMU Secondary Yaw Rate Failed Safety Fault Active HP IMU Secondary Yaw Rate Failed Safety Indication HP IMU Common Diagnostic Enable HP IMU Signal Diagnostic Enable Yaw Rate Invalid Diaqnostic	= FALSE = Available = FALSE = FALSE = FALSE =Available = FALSE = FALSE =TRUE =TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Communication Enable Manufactures Enable Counter (MEC) K_Yaw_Rate_Diagnostic_ Enable	=TRUE =0 =TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Inertial Sensor	C0520	Monitors for controller faults of the High Performance IMU Upon fault detection the emissions neutral default action action of disabling adaptive cruise and or SuperCruise will occur.	The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have been satisfied AND HP IMU Initialization Complete is False	HP IMU Initialization Timer > K_HP_IMU_Initialization_Delay	Diagnostic System Disabled Vehicle Power Mode Initialization Complete Diagnostic Communication Enable K_Common_Diag_Enable K_Communications_Fault_Pending HP IMU Initialization Complete Loss of Communication Fault Active HP IMU Initialization Complete Availability Indication HP IMU Initialization Complete Failed Safety Fault Active HP IMU Initialization Complete Failed Safety Indication HP IMU Reset Occurred Loss of Communication Fault Active HP IMU Reset Occurred Availability Indication is Available HP IMU Reset Occurred Failed Safety Fault Active	= FALSE = Propulsion = TRUE = TRUE = FALSE = FALSE = Active = FALSE = FALSE = FALSE = Active = FALSE	Continous	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					HP IMU Reset Occurred Failed Safety Indication	= FALSE		
			The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have been satisfied and any of the following are TRUE: ■HPIMU Static Offset Calibration Status is Not Calibrated All of the following are TRUE: HP Inertial Sensor Static Offset Box Swap Detected is TRUE HP Inertial Sensor Serial Number Received Value does not equal 0	See malfunction criteria	K_Communications_Fault _Pending HP IMU Static Offset Calibration Status Loss of Communication Fault Active HP IMU Static Offset Calibration Status Availability Indication is HP IMU Static Offset Calibration Status Failed Safety Fault Active HP IMU Static Offset Calibration Status Failed Safety Indication is FALSE HP IMU Common Diagnostic Enable Static Offset Calibration Diagnostic Communication Enable i Manufactures Enable Counter (MEC) is equal to 0 K_Common_Diag_Enable	= FALSE = FALSE = Available = FALSE = FALSE = TRUE = TRUE = 0 = TRUE	Continous	
			The diagnostic sub function shall record a failure if all of the following conditions are met	See malfunction criteria	K_Communications_Fault -Pending HP IMU Orientation Calibration Statue Looo of	= FALSE	Continous	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			The Enable Criteria have been satisfied and any of the following are TRUE: HP IMU Orientation Calibration Status is not equal to K_Platform_Orientation All of the following are TRUE: HP Inertial Sensor Orientation Box Swap Detected is TRUE HP Inertial Sensor Serial Number Received Value does not equal 0		Communication Fault Active HP IMU Orientation Calibration Status Availability Indication is HP IMU Orientation Calibration Status Failed Safety Fault Active HP IMU Orientation Calibration Status Failed Safety Indication is FALSE HP IMU Common Diagnostic Enable Orientation Calibration Status Diagnostic Communication Enable Manufactures Enable Counter (MEC) is equal to 0 K_Common_Diag_Enable	= FALSE = Available = FALSE = FALSE = TRUE = TRUE = 0 = TRUE		
			The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have been satisfied and any of the following are True: HP IMU Primary Temperature Invalidity is set to TRUE	See malfunction criteria	K_Communications_Fault_Pending HP IMU Primary Temperature Status Loss of Communication Fault Active HP IMU Primary Temperature Status Availability Indication is HP IMU Primary	= FALSE = FALSE = Available	Continous	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			HP IMU Secondary Temperature Invalidity is set to TRUE		Temperature Status Failed Safety Fault Active	= FALSE		
					HP IMU Primary Temperature Status Failed Safety Indication	= FALSE		
					HP IMU Common Diagnostic Enable	= TRUE		
					Primary Temperature Status Diagnostic Communication Enable	= TRUE		
					HP IMU Secondary Temperature Status Loss of Communication Fault Active	= FALSE		
					HP IMU Secondary Temperature Status Availability Indication is	= Available		
					HP IMU Secondary Temperature Status Failed Safety Fault Active	= FALSE		
					HP IMU Secondary Temperature Status Failed Safety Indication is FALSE	=FALSE		
					HP IMU Common Diagnostic Enable	=TRUE		
					Secondary Temperature Status Diagnostic Communication Enable	=TRUE		
					Manufactures Enable Counter (MEC) is equal to 0	= 0		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					K_Common_Diag_Enable	= TRUE		
			The diagnostic sub function shall record a failure if all of the following conditions are met: The Enable Criteria have been satisfied HP IMU Low Voltage Detected is TRUE	Voltage <6V	K_Communications_Fault -Pending HP IMU Low Voltage Loss of Communication Fault Active HP IMU Low Voltage Status Availability Indication is HP IMU Low Voltage Status Failed Safety Fault Active HP IMU Low Voltage Status Failed Safety Indication HP IMU Common Diagnostic Enable K_Common_Diag_Enable Low Voltage Diagnostic Communication Enable i	= FALSE = FALSE = Available = FALSE = FALSE = TRUE = TRUE =TRUE	Continous	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
System Voltage Low	P0562	Detects a low 12V system. The DTC is set at 9V, however the emissions neutral default action of disabling adaptive cruise control will not occur until 5V (the voltage at which the CAN bus will fail). This is done to ensure safety critical features can operate at low voltage.	Run Crank voltage low and high	Battery Voltage <= 9.0 Volts	Run/Crank Starter motor status Diagnostic Engine RPM	= Active = Not Engaged = Enabled >= 600.0 RPM	2.5 seconds out of a 3 seconds window Diagnoistic runs every 100 ms	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if the calibration check sum is incorrect or the flash memory detects an uncorrectable error via the Error Correcting Code. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and of SuperCruise will occur	The Primary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1 failure if the fault is detected during the first pass. 5.00 failures if the fault occurs after the first pass is complete.			Diagnostic runs continuously in the background.	Type D, 1 Trip No SDA Safety END
			The Primary Processor's Error Correcting Code hardware in the flash memory detects an error. Covers all software and calibrations.	5 failures detected via Error Correcting Code			Diagnostic runs continuously via the flash hardware.	
			The Primary Processor's calculated checksum does not match the stored checksum value for a selected subset of the calibrations.	2 consecutive failures detected .			Diagnostic runs continuously. Will report a detected fault within 200 ms.	
				In all cases, the failure count is cleared when controller shuts down				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Not Programmed	P0602	Indicates the EOCM needs to be programmed. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	This DTC is set via calibration, when KelDND_b_NoStartCal	=TRUE	Diagnoistic System is not in State of Reset. This includes: -Code Clear in Process -End of Trip Processing -Diagnoistic Re-enable in Process	Diagnoistic System is not in State of Reset.	1 second	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
ECM Long Term Memory Reset	P0603	This DTC detects an invalid NVM which includes a Static NVM, Perserved NVM, ECC ROM in NVM Flash Region, and Perserved NVM during shut down. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Static NVM region error detected during initialization				Diagnostic runs at controller power up.	Type D, 1 Trip No SDA Safety END
			Perserved NVM region error detected during initialization				Diagnostic runs at controller power up.	
			Perserved NVM region error detected during shut down.				Diagnostic runs at controller power down.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
ECM RAM Failure	P0604	Indicates that the ECM has detected a RAM fault. This includes Primary Processor System RAM Fault, Primary Processor Cache RAM Fault, Primary Processor TPU RAM Fault, Primary Processor Update Dual Store RAM Fault, Primary Processor Write Protected RAM Fault, and Secondary Processor RAM Fault. This diagnostic runs continuously. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Indicates that the primary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	3 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	Type D, 1 Trip No SDA Safety END
			Indicates that the primary processor is unable to correctly read data from or write data to cached RAM. Detects data read does not match data written >=	3 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor is unable to correctly read data from or write data to TPU RAM. Detects data read does not match data written >=	3 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor detects an illegal write attempt to protected RAM. Number of illegal writes are >	65,534 counts			Diagnostic runs continuously (background loop)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal ECM Processor Integrity Fault	P0606	Indicates that the ECM has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for both the primary and secondary processsors. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Time new seed not received exceeded			always running	0.400 seconds	Type D, 1 Trip No SDA Safety END
			MAIN processor receives seed in wrong order			always running	3 / 17 counts intermittent. 50 ms/count in the ECM main processor	
			2 fails in a row in the MAIN processor's configuration register masks versus known good data			Test is Enabled: 1 (If 0, this test is disabled)	12.5 to 25 ms	
			Checks number of stack over/under flow since last powerup reset >=	5.00		Test is Enabled: 1 (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			Safety critical software is not executed in proper order.	>= 1 incorrect sequence.		Test is Enabled: 1 (If 0, this test is disabled)	Fail Table, f(Loop Time). See supporting tables: **P0606.PSW Sequence Fail f (Loop Time)** / Sample Table, f (Loop Time)See supporting tables: **P0606_PSW Sequence Sample f(Loop Time)** counts 50 ms/count in	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
							the ECM main processor	
			MAIN processor determines a seed has not changed within a specified time period within the 50ms task.	Previous seed value equals current seed value.		Test is Enabled: 1 (If 0, this test is disabled)	Table, f(Loop Time). See supporting tables: **P0606_Last Seed Timeout f (Loop Time)**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Internal ECM Processor Integrity Performance	P0607	Indicates that the ECM has detected an internal processor integrity performance. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Performs the failure diagnostic for the offline and online BIST results.			Test is enabled: 1 . (If 0, this test is disabled)	3 counts background task/ count in the ECM main processor	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Internal Control Module EEPROM Error	P062F	This DTC detects a NVM long term performance. There are two types of diagnostics that run during controller power up. One for HWIO reports that writing to NVM (at shutdown) will not succeed, and the other HWIO reports the assembly calibration integrity check has failed. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	HWIO reports that writing to NVM (at shutdown) will not succeed				Diagnostic runs at controller power up.	Type D, SDA1 Trip Safety END
			HWIO reports the assembly calibration integrity check has failed				Diagnostic runs at controller power up.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Processor Serial Peripheral Interface Bus	P30D6	This diagnostic monitors for board level SPI errors between processors Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Failure is determined through the HWIOAPPL SPI Bus network status	8 errors out of a 16 sample window	K_Internal_Control_Module_Processor_SPIBUS3_Enable Vehicle Power Mode When the diagnostic system is not in a short term/state of reset Run crank ignition OR battery is in range AND The specified length of time has passed with the diagnostic enable criteria met	= TRUE = RUN or PROPULSION 9 < V < 16 After 0.00050 seconds	0.05 seconds out of a 0.1 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Processor Serial Peripheral Interface Bus 3	P30D8	This diagnostic monitors for board level SPI errors between processors Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Failure is determined through the HWIOAPPL SPI Bus network status	8 errors out of a 16 sample window	K_Internal_Control_Module_Processor_SPIBUS3_Enable Vehicle Power Mode When the diagnostic system is not in a short term/state of reset Run crank ignition OR battery is in range AND The specified length of time has passed with the diagnostic enable criteria met	= TRUE = RUN or PROPULSION 9 < V < 16 After 0.00050 seconds	0.05 seconds out of a 0.1 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Processor Serial Peripheral Interface Bus 4	P30D9	This diagnostic monitors for board level SPI errors between processors. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Failure is determined through the HWIOAPPL SPI Bus network status	8 errors out of a 16 sample window	K_Internal_Control_Module_Processor_SPIBUS3_Enable Vehicle Power Mode When the diagnostic system is not in a short term/state of reset Run crank ignition OR battery is in range AND The specified length of time has passed with the diagnostic enable criteria met	= TRUE = RUN or PROPULSION 9 < V < 16 After 0.00050 seconds	0.05 seconds out of a 0.1 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
P3186 (Internal Control Module Security Peripheral Performance)	P3186	This DTC indicates the security peripheral has experienced an internal fault indicating that MAC verification results are unreliable.	MAC verification has falsely passed a configurable number of times.	2.00	Calibration enable	= True Boolean		Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication on CAN Bus 2 Off	U0073	A bus off condition has been detected for the CAN 2 Bus. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	This DTC monitors for a BUS off condition onCAN Bus	A failure is detected for 3 counts for 1000 ms	Vehicle Power Mode EOCM Operational Condition Diagnoistic Enabled Supply Voltage	= RUN = EOCM Comm Active State = True 9 > V > 16V	3 seconds out of a 5 seconds window Diagnoistic runs every 1000 ms	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication on CAN Bus 1 Off	U0075	A bus off condition has been detected for the CAN 1 Bus. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	This DTC monitors for a BUS off condition on CAN Bus	A failure is detected for 3 counts for 1000 ms	Vehicle Power Mode EOCM Operational Condition Diagnoistic Enabled Supply Voltage	= RUN = EOCM Comm Active State = True 9 > V > 16V	3 seconds out of a 5 seconds window Diagnoistic runs every 1000 ms	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication on CAN Bus 8 Off	U007E	A bus off condition has been detected for the CAN 8 Bus. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	This DTC monitors for a BUS off condition on GM HS CAN Bus	A failure is detected for 3 counts for 1000 ms	Vehicle Power Mode EOCM Operational Condition Diagnoistic Enabled Supply Voltage	= RUN = EOCM Comm Active State = True 9 > V > 16V	3 seconds out of a 5 seconds window Diagnoistic runs every 1000 ms	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Transmission Control Module	U0101	This DTC monitors for a loss of communication with the tranmission. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Message not Recieved from Controller for: TrnsEstGrAuth TrnsShftLvrPstnAuth TEGP_TransCmndGrAuth	 >0.050 seconds > 0.050 seconds > 0.050 seconds	Vehicle Supply Voltage ECU Operating Conditions: U010100_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Interial Sesnsor	U0125	This DTC monitors for a loss of communication with the tranmission. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Message not Recieved from Controller for: HPIDGJnitCmplt HPIDG_LoVltgDtd HPIDGjDrntnCalSts HPIDG_PriTemp HPIDG_RstOcc HPIDG SecTemp HPIDG_StcOfstCalSts HPIDG_LatAcce ICo rrSts HPIDP_LatAccel HPIDS_LatAccel HPIDG_LngAccelCorrSts HPIDP_LngAccel HPIDS_LngAccel HPIDP_YawAccel HPIDS_YawAccel HPIDG_YawRateCorrSts HPIDP_YawRate HPIDS_YawRate	 >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds	Vehicle Supply Voltage ECU Operating Conditions: U012500_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9< V< 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Power Steering Control Module	U0131	This DTC monitors for a loss of communication with the power steering system. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Message not Recieved from Controller for: DASTP_StrTrqAuth SteeringTorqueOverlayDeliveredAuth SteeringRequestDeliveredStatusAuth EPSTTDP_TotTorqDlvdAuth ArbitratedSteeringFeatureRequestActiveAuth SteeringWheelHandsOffDetectionConfidenceLevelAuth SteeringWheelHandsOffDetectionModeAuth SWHOP_StAuth SWIP_StrgWhlAngAuth SWIP_StrgWhlAngCalStsAuth SWIP_StrgWhlAngGradAuth	 > 0.05 seconds > 0.25 seconds > 0.25 seconds >0.05 seconds > 0.25 seconds > 0.25 seconds > 0.25 seconds > 0.25 seconds > 0.05 seconds > 0.05 seconds > 0.05 seconds	Vehicle Supply Voltage ECU Operating Conditions: U013100_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9< V< 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Body Control Module	U0140	This DTC monitors for a loss of communication with the Body Control Module. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Message not Recieved from Controller for: DayNightStatusAuth BrkPedInitTirvlAch vd Auth BrkPdIPosAuth CP_CruzSecSwStatAuth HSP_D rv AlrtTyp Cst CurrS etValAuth HapticSeatActiveAuth HSP_H ptcStOprtlStsAu th HSP_HptcStPrsntAuth TeenDrvActAuth TransportStorageLogistics ModeActivation VMMP_StatAuth	 > 0.25 seconds > 0.05 seconds > 0.05 seconds > 0.05 seconds >2.50 seconds >2.50 seconds >2.50 seconds >2.50 seconds >2.50 seconds >2.50 seconds >2.50 seconds	Vehicle Supply Voltage ECU Operating Conditions: U014000_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9< V< 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communciation with Restraints Control Module	U0151	This DTC monitors for a loss of communication with the restrains control module. Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Message not Recieved from Controller for: LLDP_LatAccelAuth LLDP_LatAccelSnsrCorrStsAuth LLDP_LongAccelAuth LLDP_LongAccelSnsrCorrStsAuth DriverSeatBeltStatusAuth PCIP_CruiseControlDisableRequestedAuth YRP_YawRateAuth YRP_YawRateCorrAuth	 > 0.250 seconds > 0.250 seconds > 0.250 seconds > 0.250 seconds > 2.50 seconds > 2.50 seconds > 0.050 seconds > 0.050 seconds	Vehicle Supply Voltage ECU Operating Conditions: U015100_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Radar Sensor Module - Long Range	U0235	This DTC monitors for a loss of communication with the long range radar. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Message not Recieved from Controller for: LRRODP_Brst1_Prtctd LRRODP_Brst2_Prtctd LRRODP_Brst3_Prtctd LRRODP_Brst4_Prtctd LRRODP_Brst5_Prtctd LRRODP_Brst6_Prtctd	 > 0.25 seconds > 0.25 seconds >0.25 seconds >0.25 seconds > 0.25 seconds > 0.25 seconds	Vehicle Supply Voltage ECU Operating Conditions: U021100_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communciation with Video Processing Module	U023C	This DTC monitors for a loss of communication with the video processing module Upon fault detection the emissions neutral default action action of disabling adaptive cruise control will occur.	Message not Recieved from Controller for: SrrndVsnRLSDatBrst Aux1CameraConnectionStatus Aux2CameraConnectionStatus	 > 0.250 seconds > 0.250 seconds > 0.250 seconds	Vehicle Supply Voltage ECU Operating Conditions: U023C00_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Radar Sensor Module - Short Range Left Front	U023D	This DTC monitors for a loss of communication with the short range radar. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Message not Recieved from Controller for: SRRLFODP_Brst1_Prtctd SRRLFODP_Brst2_Prtctd SRRLFODP_Brst3_Prtctd SRRLFODP_Brst4_Prtctd SRRLFODP_Brst5_Prtctd SRRLFODP_Brst6_Prtctd	 > 0.20 seconds > 0.20 seconds >0.20 seconds >0.20 seconds > 0.20 seconds > 0.20 seconds	Vehicle Supply Voltage ECU Operating Conditions: U023D00_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Radar Sensor Module - Short Range Right Front	U023E	This DTC monitors for a loss of communication with the short range radar. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Message not Recieved from Controller for: SRRRFODP_Brst1_Prtctd SRRRFODP_Brst2_Prtctd SRRRFODP_Brst3_Prtctd SRRRFODP_Brst4_Prtctd SRRRFODP_Brst5_Prtctd SRRRFODP_Brst6_Prtctd	 > 0.20 seconds > 0.20 seconds >0.20 seconds >0.20 seconds > 0.20 seconds > 0.20 seconds	Vehicle Supply Voltage ECU Operating Conditions: U023E00_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Camera Module - Front	U0265	This DTC monitors for a loss of communication with the front camera module. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Message not Recieved from Controller for: FCODP_Brst1_Prtctd FCODP_Brst2_Prtctd FCODP_Brst3_Prtctd FCODP_Brst4_Prtctd FCODP_Brst5_Prtctd FCODP_Brst6_Prtctd FCODP_Brst7_Prtctd FCODP_Brst8_Prtctd FCODP_Brst9_Prtctd FCODP_Brst10_Prtctd	 > 0.25 seconds > 0.25 seconds >0.25 seconds >0.25 seconds > 0.25 seconds > 0.25 seconds > 0.25 seconds > 0.25 seconds > 0.25 seconds > 0.25 seconds	Vehicle Supply Voltage ECU Operating Conditions: U026500_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Engine Control Module	U0401	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	An error has been detected on one of the following message: ActAxleTrqAuth AdaptiveCruiseControlAxleTorqueCommandLimitingStateAuth AdaptiveCruiseControlAxleTorqueCommandRequestStateAuth CCEP_Auth DrvIntndAxlTrqMxAuth DrvIntndAxlTrqAuth EngSpdAuth PTSndBrkPdIPsAuth PSP_EngRnngAuth PSP_Prpl8ysActvAuth AtTrnsCmndGrAuth TrnsEstGrAuth TrnsShftLvrPstnAuth AccActPstAuth AAP_AccelPedOvrrdActvAuth VMI1P_VehTopSpdLimArbdValAuth	 6 out of 10 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	1.5 seconds out of a 2.5 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			VMI1P_VehTopSpdLimModeActvAuth VSADP_VehSpdAvgDrvnAuth VSNDP_VehSpdAvgNDrvnAuth	6 out of 10 messages 3 out of 4 messages 6 out of 10 messages				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Transmission Control Module	U0402	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	An error has been detected on one of the following message: AtTrnsCmndGrAuth TrnsEstGrAuth TrnsShftLvrPstnAuth	 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.075 seconds out of a 0.125 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Electronic Brake Control Module	U0418	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	An error has been detected on one of the following message: ABSAtvAuth ABSFIdAuth BrkPdIDrvAppPrsDetcdAuth BrkPdIDrvAppIPresAuth TCSP_ESCActvAuth TCSP_ESCSysStsAuth TCSP_ActvAuth TCSP_DrvrIntntAuth TCSP_FaildAuth WhlAngVelLFrtAuth WhlAngVelRFrtAuth FWDECP_LFAuth FWDECP_RFAuth FWDECP_RstOccAuth WhlAngVelLRrAuth WhlAngVelRRrAuth RWDECP_LRAuth RWDECP_RRAuth	6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.3 seconds out of a 0.4 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			RWDECP_RstOccAuth	6 out of 10 messages				
			EPBSP_ElecPrkBrkApplStsAuth	3 out of 4 messages				
			WRDSP_LFAuth	3 out of 4 messages				
			WRDSP_LRAuth	3 out of 4 messages				
			WRDSP_RFAuth	3 out of 4 messages				
			WRDSP_RRAuth	3 out of 4 messages				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Power Steering Control Module	U0420	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	An error has been detected on one of the following message: DASTP_StrTrqAuth SteeringTorqueOverlayDeliveredAuth SteeringRequestDeliveredStatusAuth EPSTTDP_TotTorqDlvdAuth SteeringAssistStatusAuth SteeringAssistThermalInhibitedAuth SteeringPerformanceActualModeAuth SteeringTorqueRequestOverlayAvailableLeftAuth SteeringTorqueRequestOverlayAvailableRightAuth SteeringWheelAngleIntegrityStatusAuth SteeringWheelTorqueIntegrityStatusAuth ArbitratedSteeringFeatureRequestActiveAuth SteeringWheelHandsOffDetectionConfidenceLevelAuth	 6 out of 10 messages 3 out of 4 messages 3 out of 4 messages 6 out of 10 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.3 seconds out of a 0.4 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			SteeringWheelHandsOffDetectionModeAuth	3 out of 4 messages				
			SWHOP.StAuth	3 out of 4 messages				
			SWIP_StrgWhlAngAuth	6 out of 10 messages				
			SWIP_StrgWh 1An gCalSts Auth	6 out of 10 messages				
			SWI P_StrgWhIAngGradAuth	6 out of 10 messages				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Body Control Module	U0422	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	An error has been detected on one of the following message: BrkPed1nitTirvlAch vd Auth BrkPdIModTrvlAchAuth BrkPdIPosAuth CP_CruzSecSwStatAuth CP_CruzSpdLmtrSwStatAuth SPMP_SysPwrModeAuth	 6 out of 10 message 6 out of 10 message 6 out of 10 message 6 out of 10 message 6 out of 10 message 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9< V< 16 = True > 5 seconds = 0	1.5 seconds out of a 2.5 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Instrument Panel Cluster	U0423	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations	An error has been detected on one of the following message: ACCSAAMSLP_TypAuth ACCSAAMSLP_SpdLimCnfrmdAuth ChimeSystemStateofHealthAuth IPCDisplayStatusAuth LaneFollowingChimeInterfaceFaultDetectedAuth MCRLDOperationalStatusAuth	 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages	Vehicle Supply Voltage PNC.ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	8 seconds out of a 10 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Radar Sensor Module - Long Range	U0433	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	An error has been detected on one of the following message: LRRODP_Brst1_Prtctd LRRODP_Brst2_Prtctd LRRODP_Brst3_Prtctd LRRODP_Brst4_Prtctd LRRODP_Brst5_Prtctd LRRODP_Brst6_Prtctd	 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.03 seconds out of a 0.04 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Restraints Control Module	U0452	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	An error has been detected on one of the following message: LLDP_LatAccelAuth LLDP_LatAccelSnsrCorrStsAuth LLDP_LongAccelAuth LLDP_LongAccelSnsrCorrStsAuth PCIP_CruiseControlDisableRequestedAuth YRP_YawRateAuth YRP_YawRateCorrAuth	6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 8 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	8 seconds out of a 10 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Telematics Module	U0499	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and/or SuperCruise wil occur	An error has been detected on one of the following message: RPPSD_Brst RedundantPrecisePositioningSystemHeading RedundantPrecisePositioningSystemLatitude RedundantPrecisePositioningSystemLongitude	 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	8 seconds out of a 10 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From External Object Calculation Module 1 - Processor 2	U053C	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and/or SuperCruise wil occur	An error has been detected on one of the following message: H2H1DDG1_CRC8_FsFA H2H1DDG2_CRC8_FsFA H2H1DDG3_CRC8_FsFA H2H1DDG4_CRC8_FsFA H2H1DDG5_CRC16_FsFA H2H1DDG6_CRC8_FsFA RPPSD_Brst	 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	8 seconds out of a 10 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From External Object Calculation Module 1	U053D	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and/or SuperCruise wil occur	An error has been detected on one of the following message: H1H2DDG1_CRC8 H1H2DDG2_CRC8 H1H2DDG3_CRC8 H1H2DDG4_CRC8 H1H2DDG5_CRC16 H1H2DDG6_CRC8 FCODPB1P_FVLBTk1Clr Auth	 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnabl e (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	8 seconds out of a 10 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from High Definition Localization Module	U053D	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and/or SuperCruise wil occur	An error has been detected on one of the following message: HiDefnMapStsEnvInfo HDMSEIP_CohrcylDAuth HDMSEIP_HashValAuth	 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnabl e (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	8 seconds out of a 10 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Video Processing Module	U053D	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and/or SuperCruise wil occur	An error has been detected on one of the following message: SrrndVsnRLSDatBrst Aux1CameraConnectionStatus Aux2CameraConnectionStatus	 6 out of 10 messages 6 out of 10 messages 6 out of 10 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	8 seconds out of a 10 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Camera Module - Front	U0566	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	An error has been detected on one of the following message: SLVFSP.SpdLimVsnFsd SpdAuth SLVFSP_NwDtdAuth SLVFSP.UntAuth FCODP_Brst1_Prtctd FCODP_Brst2_Prtctd FCODP_Brst3_Prtctd FCODP_Brst4_Prtctd FCODP_Brst5_Prtctd FCODP_Brst6_Prtctd FCODP_Brst7_Prtctd FCODP_Brst8_Prtctd FCODP_Brst9_Prtctd FCODP_Brst10_Prtctd FCODP_Brst11_Prtctd	 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages 3 out of 4 messages	Vehicle Supply Voltage PNC_ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	3 seconds out of a 4 seconds window (Based on the slowest signal tranmission)	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Radar Sensor Module - Short Range Left Rear	U1126	This DTC monitors for a loss of communication with the short range radar	Message not Recieved from Controller for: SRRLRODP_Brst1_Prtctd SRRLRODP_Brst2_Prtctd SRRLRODP_Brst3_Prtctd SRRLRODP_Brst4_Prtctd SRRLRODP_Brst5_Prtctd SRRLRODP_Brst6_Prtctd	 > 0.20 seconds > 0.20 seconds >0.20 seconds >0.20 seconds > 0.20 seconds > 0.20 seconds	Vehicle Supply Voltage ECU Operating Conditions: U112600_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Radar Sensor Module - Short Range Right Rear	U1127	This DTC monitors for a loss of communication with the short range radar	Message not Recieved from Controller for: SRRRRODP_Brst1_Prtctd SRRRRODP_Brst2_Prtctd SRRRRODP_Brst3_Prtctd SRRRRODP_Brst4_Prtctd SRRRRODP_Brst5_Prtctd SRRRRODP_Brst6_Prtctd	 > 0.20 seconds > 0.20 seconds >0.20 seconds >0.20 seconds > 0.20 seconds > 0.20 seconds	Vehicle Supply Voltage ECU Operating Conditions: U112700_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Radar Short Range Sensor - Side Left Rear	U1150	This DTC monitors for a loss of communication with the short range radar	Message not Recieved from Controller for: SRRSLRODPB1P_AcqTmStmAuth	> 0.20 seconds	Vehicle Supply Voltage ECU Operating Conditions: U112700_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Radar Short Range Sensor - Side RightRear	U1151	This DTC monitors for a loss of communication with the short range radar	Message not Recieved from Controller for: SRRSRRODPB1P_AcqTmStmAuth	> 0.20 seconds	Vehicle Supply Voltage ECU Operating Conditions: U112700_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Radar Sensor Module - Short Range Left Front	U130F	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations	An error has been detected on one of the following message: SRRLFODP_Brst1_Prtctd SRRLFODP_Brst2_Prtctd SRRLFODP_Brst3_Prtctd SRRLFODP_Brst4_Prtctd SRRLFODP_Brst5_Prtctd SRRLFODP_Brst6_Prtctd	 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages	Vehicle Supply Voltage PNC.ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.4 seconds out of a 0.5 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Radar Sensor Module - Short Range Right Front	U1310	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations	An error has been detected on one of the following message: SRRRFODP_Brst1_Prtctd SRRRFODP_Brst2_Prtctd SRRRFODP_Brst3_Prtctd SRRRFODP_Brst4_Prtctd SRRRFODP_Brst5_Prtctd SRRRFODP_Brst6_Prtctd	 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages	Vehicle Supply Voltage PNC.ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.4 seconds out of a 0.5 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Radar Sensor Module - Short Range Left Rear	U1311	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations	An error has been detected on one of the following message: SRRLRCODP_Brst1_Prtctd SRRLRCODP_Brst2_Prtctd SRRLRCODP_Brst3_Prtctd SRRLRCODP_Brst4_Prtctd SRRLRCODP_Brst5_Prtctd SRRLRCODP_Brst6_Prtctd	 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages	Vehicle Supply Voltage PNC.ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.4 seconds out of a 0.5 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Radar Sensor Module - Short Range Right Rear	U1312	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations	An error has been detected on one of the following message: SRRRRODP_Brst1_Prtctd SRRRRODP_Brst2_Prtctd SRRRRODP_Brst3_Prtctd SRRRRODP_Brst4_Prtctd SRRRRODP_Brst5_Prtctd SRRRRODP_Brst6_Prtctd	8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages 8 out of 10 messages	Vehicle Supply Voltage PNC.ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.4 seconds out of a 0.5 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Radar Short Range Sensor - Side Left Rear	U1366	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations	An error has been detected on one of the following message: SRRSLRODPB1P_AcqTmStmAuth	6 out of 10 messages	Vehicle Supply Voltage PNC.ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.4 seconds out of a 0.5 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Radar Short Range Sensor - Side Right Rear	U1367	This diagnostic monitors for signal protections (ARC, Checksum, or MAC) violations	An error has been detected on one of the following message: SRRSRRODPB1P_AcqTmStmAuth	6 out of 10 messages	Vehicle Supply Voltage PNC.ActiveTxPDUEnable (Any Partial Network that the ECU participates in is active) Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter At least 5 seconds after a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition.	9 < V < 16 = True > 5 seconds = 0	0.4 seconds out of a 0.5 seconds window	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication With Gateway A on CAN 1	U1607	This DTC monitors for a loss of communication with the gateway module on CAN1 Upon fault detection the emissions neutral default action action of disabling adaptive cruise control and/or SuperCruise	Message not Recieved from Controller for: ChimeManagerStatus	> 2.50 seconds	Vehicle Supply Voltage ECU Operating Conditions: U160700_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communciation with Brake System Control Module on CAN 1	U160F	This DTC monitors for a loss of communication with the brake controller on CAN1 Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Message not Recieved from Controller for: ABSAtvAuth ABSFIdAuth BrkPdIDrvAppPrsDetcdAuth BrkPdIDrvAppIPresAuth TCSP_ESCActvAuth TCSP_ESCSysStsAuth TCSP_FaildAuth WhlAngVelLFrtAuth WhlAngVelRFrtAuth FWDECP_LFAuth FWDECP_RFAuth FWDECP_RstOccAuth WhlAngVelLRrAuth WhlAngVelRRrAuth RWDECP_LRAuth RWDECP_RRAuth RWDECP_RstOccAuth	> 0.05 seconds > 0.05 seconds > 0.05 seconds > 0.05 seconds > 0.625 seconds > 0.625 seconds > 0.625 seconds > 0.05 seconds > 0.05 seconds > 0.250 seconds > 0.250 seconds > 0.250 seconds >0.05 seconds >0.05 seconds > 0.250 seconds > 0.250 seconds > 0.250 seconds	Vehicle Supply Voltage ECU Operating Conditions: U160F00_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9< V< 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communciation with Brake System Control Module on CAN 2	U1610	This DTC monitors for a loss of communication with the brake controller on CAN2. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Message not Recieved from Controller for: VAP_ActlVehAccelAuth CBIP_ACCBrkgActvAuth ACCPrfMdRq ABSPr EPBSP_ElecPrkBrkApplStsAuth TBI2P_TrlrBrkgManAppAtvAuth WRDSP_LFAuth	 > 0.30 seconds > 0.05 seconds > 2.50 seconds > 2.50 seconds > 0.25 seconds > 0.30seonds > 0.30 seconds	Vehicle Supply Voltage ECU Operating Conditions: U161000_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Engine Control Module on CAN2	U1611	This DTC monitors for a loss of communication with the engine control module on CAN 2. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	Message not Recieved from Controller for: CollisionPreparationSystemAxleTorqueCommandRequestStateAuth DrvIntndAxlTrqMnAuth DrvIntndAxlTrqMxAuth DrvIntndAxlTrqAuth EngSpdAuth TrnsEstGrAuth TrnsShftLvrPstnAuth AccActPstAuth VSADP_VehSpdAvgDrvnAuth VSNDP_VehSpdAvgNDrvnAuth WhlDstPrRvlFrtAuth WhlDstPrRvlRrAuth	> 0.250 seconds >0.100 seconds >0.100 seconds > 0.100 seconds >0.050 seconds >0.050 seconds > 0.050 seconds >0.050 seconds > 0.250 seconds >0.625 seconds >2.50 seconds >2.50 seconds	Vehicle Supply Voltage ECU Operating Conditions: U161100_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with External Object Calculation Module 1 - Processor 2 on Ethernet	U1623	This DTC monitors for a loss of communication with the EOCM HCP1 on internal ethernet. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and SuperCruise will occur	Message not Recieved from Controller for: H2H1DDG1_CRC8_LcFA H2H1DDG2_CRC8_LcFA H2H1DDG3_CRC8_LcFA H2H1DDG4_CRC8_LcFA H2H1DDG5_CRC16_LcFA H2H1DDG6_CRC8_LcFA	 >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds	Vehicle Supply Voltage ECU Operating Conditions: U161100_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9 < V < 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Telematics Control Platform on Ethernet	U1624	This DTC monitors for a loss of communication with the TCP on internal ethernet. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and SuperCruise will occur	Message not Recieved from Controller for: PPPS2DAbsolutePosition ErrorEstimate PPPSAbsoluteHeadingErr orEstimate PrimaryPrecisePositioning SystemCalendarDay PrimaryPrecisePositioning SystemCalendarYear PrimaryPrecisePositioning SystemElevation PrimaryPrecisePositioning SystemHeading PrimaryPrecisePositioning SystemLatitude PrimaryPrecisePositioning System LocationUsable PrimaryPrecisePositioning SystemLongitude PrimaryPrecisePositioning SystemLowerGlobalTime Stamp PrimaryPrecisePositioning SystemMode PrimaryPrecisePositioning SystemSignalAcquisitionT ime	 >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds	Vehicle Supply Voltage ECU Operating Conditions: U161100_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9< V< 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			PrimaryPrecisePositioning SystemTimeofDay PrimaryPrecisePositioning SystemllpperGlobalTime Stamp	>0.050 seconds >0.050 seconds				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with External Object Calculation Module 1 - Processor 1 on Ethernet	U1625	This DTC monitors for a loss of communication with the EOCM HCP1 on internal ethernet. Upon fault detection the emissions neutral default action action of disabling adaptive cruise and SuperCruise will occur	Message not Recieved from Controller for: H1H2DDG1_CRC8 H1H2DDG2_CRC8 H1H2DDG3_CRC8 H1H2DDG4_CRC8 H1H2DDG5_CRC16 H1H2DDG6_CRC8	 >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds >0.050 seconds	Vehicle Supply Voltage ECU Operating Conditions: U161100_Enable Exceptions: If the vehicle is in Transport Mode OR Within the first 5 seconds of a power-up reset, a running reset, a recovery from an under voltage condition or a recovery from an over voltage condition. OR When a bus off condition (U007X) is Active	9< V< 16 Any Partial Network that the ECU participates in is active = True	See Threshold Values	Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.

Key Table Not Provisioned / Authoritative Counter At Maximum	U1960	This DTC indicates that the ECU security peripheral key slots are not provisioned OR ECU message authenticatioon Authoritative Counters are at MAX value.
		
		Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.
			During controller initialization:
			
			IF (Any Security Peripheral Key Slot reports as Empty)
			-OR-
			(Any Authoritative Counter is at MAX value)
			
			During controller operation:
			
			IF (A Security Peripheral Key Slot reports as Empty)
			-OR-
			(An Authoritative Counter is at MAX value)
						Diagnostic Enabled:
						
						KaSSAR_h_DiagEnableCals[1] == Enabled
								Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
U1961 (Security Peripheral Performance)	U1961	This DTC indicates that the ECU security peripheral has reported that it has failed. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur.	The ECU security peripheral reports that the security peripheral hardware has failed.			Diagnostic Enabled: KaSSAR_h_DiagEnableCals[2] == Enabled		Type D, 1 Trip No SDA Safety END

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
U1962 (Unable to Authenticate Serial Data Message)	U1962	This DTC indicates that serial data message authentication on any key slot has failed a configurable number of times this key cycle. Upon fault detection the emissions neutral default action action of disabling adaptive cruise will occur. It should noted not all devices with incorrect authentication will set the default action - only applies to adaptive cruise critical devices.	Message authentication on a single key slot has failed a configurable number of times.	=>3		Diagnostic Enabled: 1.00 (True)		Type D, SDA1 Trip Safety END

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Hand Wheel Angle Sensor - SASInternal Electronic Failure	C0051-49	Monitoring for hand wheel angle data	Both handwheel angle sensors fault (protocol falut, sensor internal fault, power supply failure)	TRUE	Diagnostic Voltage Vehicle Power Mode Manufacturing Enable Counter	= Enabled = 6V < voltage < 16V = RUN = 0	2ms	Safety Emissions Neutral Diagnostic - Type C
Hand Wheel Angle Sensor - SASCalibration Not Learned	C0051-54	Read handwheel angle trim value	Calibration Not Learned	Calibration not saved to NVM	Diagnostic Voltage Vehicle Power Mode Manufacturing Enable Counter	= Enabled = 6V < voltage < 16V = RUN = 0	2ms	Safety Emissions Neutral Diagnostic - Type C
Steering Motor Position Sensor Hardware Diagnostic Status	C1146-96	Correlation between motor position sensors	Motor Position Corrrelation exceeded tolerance	>7	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	2ms	Safety Emissions Neutral Diagnostic - Type C
Steering Motor Position Sensor Hardware Diagnostic Status	C1146-96	Motor Sensor 0 protocol fault	Protocol fault registered on IC (IC internal error, temperature out of range, sensor under voltage, parity error)	TRUE	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	2ms	Safety Emissions Neutral Diagnostic - Type C
Steering Motor Position Sensor Hardware Diagnostic Status	C1146-96	Motor Sensor 1 protocol fault	Protocol fault registered on IC (IC internal error, temperature out of range, sensor under voltage, parity error)	TRUE	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	2ms	Safety Emissions Neutral Diagnostic - Type C
Steering Rack Rate of Change Above Threshold	C11A6-00	Motor position threshold exceeded	Kinematic Integrity Fault	> 1250	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	2ms	Safety Emissions Neutral Diagnostic - Type C
Steering Rack Rate of Change Above Threshold	C11A6-00	Monitoring hand wheel to motor angle	Hand wheel angle to motor angle correlation exceeded tolerance	> 15	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	2ms	Safety Emissions Neutral Diagnostic - Type C

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Bus Signal Failure	U007E	Control Module Communication CAN Bus 8 Off Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer.	CAN driver indicates a bus off condition has occurred	= Fault Detected	Vehicle Supply Voltage PNC_ActiveTxPDUEnable U007E00_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event Power Mode	9V < voltage < 16V = True = Enabled = Inactive > 5 seconds = Run	Monitored continuously while CAN frames are being transmitted and received	Safety Non-MIL Emission neutral Diagnostic
Lost Communication with Central Gateway Module	U0146	Detects loss of communication between FCM_LC (Front Camera Module Low Content) and CGM (Central Gateway Module). The emissions neutral default action (described below) will only occur if both U0422 and U0477 are triggered at the same time, otherwise the camera will function normally. The emissions neutral default action is either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the	Monitored Messages: CGM_CAN8_MSG05 CGM_CAN8_MSG03 CGM_CAN8_MSG01	 = 2.5000 seconds (timeout) = 2.5000 seconds (timeout) = 0.0250 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable U014600_ENABLE Time since power up reset or running reset or under voltage or over voltage condition event DTC U007E00	9V < voltage < 16V = True = Enabled > 5 seconds = Inactive	Monitored continuously while CAN frames are being transmitted and received Fault maturation time is 02.5000 seconds	Safety Non-MIL Emission neutral Diagnostic
Invalid Data Received from Body Control Module	U0422	Detects Alive Rolling Counter (ARC) or Message Authentification Code (MAC) error in messages received from the Body Control Module (BCM). The emissions neutral default action (described below) will only occur if both U0422 and U0477 are triggered at the same time, otherwise the camera will function normally. The emissions neutral default action is either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the	The following messages are monitored for failed safety, security, continuous operation or protection and this code sets if a message fails any of these criteria for the timeout period SysPwrMode_Prtctd_MSG	 = 0.62500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the Body Control Module (BCM) Fault maturation time is 0.62500 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from Central Gateway Module	U0447	Detects Alive Rolling Counter (ARC) or Message Authentification Code (MAC) error in messages received from the Central Gateway Module (CGM). The emissions neutral default action (described below) will only occur if both U0422 and U0477 are triggered at the same time, otherwise the camera will function normally. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer.	The following messages are monitored for failed safety, security, continuous operation or protection and this code sets if a message fails any of these criteria for the timeout period BkupSysPwrMode_Prtctd_MSG	= 0.62500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the Central Gateway Module (CGM) Fault maturation time is 0.62500 seconds	Safety Non-MIL Emission neutral Diagnostic
Invalid Data Received from External Object Calculating Module 1	U053B	Detects Alive Rolling Counter (ARC) or Message Authentification Code (MAC) error in messages received from the External Object Calculation Module 1. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer.	The following messages are monitored for failed safety, security, continuous operation or protection and this code sets if a message fails any of these criteria for the timeout period HstVehPathParms_Prtctd_MSG	= 0.02500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the External Object Calculation Module 1 Fault maturation time is 0.02500 seconds	Safety Non-MIL Emission neutral Diagnostic
Lost Communication with External Object Calculating Module 1 on CAN Bus 8	U1616	Detects loss of communication between FCM_LC (Front Camera Module Low Content) and EOCM (External Object Calculating Module) on CAN bus 8. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer.	The following messages are monitored for late arrival and this code sets if a message times out HstVehPathParms_Prtctd_MSG	= 0.02500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable U161600_ENABLE Time since power up reset or running reset or under voltage or over voltage condition event DTC U007E00	9V < voltage < 16V = True = Enabled > 5 seconds = Inactive	Monitored continuously while CAN frames are being transmitted and received Fault maturation time is 0.02500 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Key Table Not Provisioned	U1960	The confirmed status for this DTC indicates that at least one Security Peripheral General Key must be provisioned. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer.	The Authoritative Counter Any single Key Slot Provision State Flag for Key 2 through to the final Key AND OBD Manufacturing Enable Counter ERC_KEY_EMPTY	= Max Value = 0 = 0 = TRUE	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SecurityPeripheralPerformanc eDiagnosticPowerModeTime U196000_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event All of the previous conditions plus any one of the following: 1) Monitored continuously while CAN frames are being transmitted and received.	9V < voltage < 16V = True >= 5 seconds = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received.	Safety Non-MIL Emission neutral Diagnostic
Security Peripheral Performance - Performance or Incorrect Operation	U1961	The confirmed status for this DTC indicates that the Front Camera Module Low Content (FCM_LC) must be replaced due to an internal error. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer.	1) The security peripheral is considered to have failed if a request to the security peripheral cannot generate a Message Authentication Code (MAC) due to an internal error (not due to software timeouts). 2) The security peripheral is considered to have failed if a request to the security peripheral cannot verify a Message Authentication Code (MAC) due to an internal error (not due to software timeouts).	= Fault Detected	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SecurityPeripheralPerformanc eDiagnosticPowerModeTime U196192_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event	9V < voltage < 16V = True >= 5 seconds = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received	Safety Non-MIL Emission neutral Diagnostic
Unable to Authenticate Serial Data Message	U1962	Monitors incoming message authentification code and compares with the expected based on message source. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer. It should noted not all devices with incorrect authentication will set the default action - only applies to adaptive cruise critical devices.	A Message Authentication Code results in failed verification for a calibratable number of consecutive verification attempts for a specific key slot number of consecutive failures failures	>k_ERRH_C_FailedAuthentication Counter	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SerialDataAuthentificationPo werModeTime Fault Code U196192 U196200_ENABLE Transport Mode Time since power up reset or running reset or under voltage	9V < voltage < 16V = True >= 2 seconds = Inactive = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Front Camera Module Low Content Internal/Programming failures	U3000	Control Module General Checksum Failure. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer. Applies for all diagnostics listed under U3000.	Internal Front Camera Module Low Content (FCM_LC) Memory Checksum Failure Detected.	= Fault Detected	Vehicle Supply Voltage U300041_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Control Module General Memory Failure	General Memory Failure Detected	= Fault Detected	Vehicle Supply Voltage U300042_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Control Module Data Memory Failure	a data (or working) memory failure for embedded systems using FLASH RAM memory has occurred	= Fault Detected	Vehicle Supply Voltage U300044_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Control Module Internal Electronic Failure	Front Camera Module Low Content (FCM_LC) internal circuit micro (Not Image Processing Engine) is detected - BIST Fail - Registier Check Error - Internal Voltage Out of Range - Informed Primm Prrnr	= Fault Detected	Vehicle Supply Voltage U300049_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Control Module Not Programmed	Application Data File Not Programmed CRC Calculated in Chunks - Missing Data	= Fault Detected	Vehicle Supply Voltage U300051_ENABLE	9V < voltage < 16V = Enabled	Startup	Safety Non-MIL Emission neutral Diagnostic
		Control Module Deactivated due to incorrect or invalid data provied to FCM OR Internal Falure (as listed)	-Bad or out of date vehicle yaw, or speed provided -Imager timestamp indicates missing image -EyeQ performs CRC check on program section of code in DDR RAM -Internal data strcuture CRC mismatch -Internal input signals storage corruption -Stack Over/Underflow detection -EyeQ challenge and response failure -Clock Error -All EyeQ messages stopped - Stale Data	= Fault Detected	Vehicle Supply Voltage U300053_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Control Module Missing Calibration	Camera has not been calibrated or camera calibration process failed. Out of calibration	= Fault Detected	Vehicle Supply Voltage U300054_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Control Module Not Configured	Sub system option content or vehilcle option content not programmed	= Fault Detected	Vehicle Supply Voltage U300055_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Control Module Invalid Incompatible Configuration	Control Module or System Configuration not valid	= Fault Detected	Vehicle Supply Voltage U300056_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Control Module Invalid Incompatible Software Component	Software component not compatible with detected hardware/software	= Fault Detected	Vehicle Supply Voltage U300057_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
Vehicle Identification Number	U3002	Diagnostic detects VIN not programmed	This diagnostic shall fail if VIN stored in EEPROM contains all bytes such that: VIN EEPROM	= OxFF	Vehicle Supply Voltage Vehicle Power Mode U300251_ENABLE OBD Manufacturer Enable Counter	9V < voltage < 16V = Run = Enabled = 0	Startup	Safety Non-MIL Emission neutral Diagnostic
		This diagnostic detects a VIN mismatch	Any digit of the programmed VIN does not match the digits of the VIN transmitted over the GMLAN. In addition, the VIN numbers programmed in EEPROM are NOT all OxFF's such that: VIN Stored AND VIN Stored	Does not equal VIN transmitted over GMLAN Does not equal to OxFF	Vehicle Supply Voltage Vehicle Power Mode U300256_ENABLE OBD Manufacturer Enable Counter	9V < voltage < 16V = Run = Enabled = 0	Startup	Safety Non-MIL Emission neutral Diagnostic
Battery Supply Voltage	U3003	Battery Voltage - Circuit Voltage Below Threshold. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer. Applies for all diagnostics listed under U3003.	Front Camera Module Low Content (FCM_LC) supply voltage (Vsup)	< 9.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active. U300316_ENABLE	> 5 seconds = Enabled	3.000 Seconds	Safety Non-MIL Emission neutral Diagnostic
		Battery Voltage - Circuit Voltage Above Threshold	Front Camera Module Low Content (FCM_LC) supply voltage (Vsup)	> 16.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active. U300317_ENABLE	> 5 seconds — RnoKlarl	3.000 Seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Ethernet Bus 11 (+)	B1A09	Monitoring for a failure of the Ethernet Bus connected to the HDLM Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the	Upon receipt of Link status =Down for a specific port for a calibratable amount of time	<1 second	Vehicle Power Mode: VN Activation Conditions: Supply Voltage Virtual Network condition Diagnostic_ENABLE	= RUN COMM_ENABLE=HIGH = 9 - 16V = Any Virtual Network that the ECU participates in is active. # disabled	Continuosuly	Safety Non-MIL Emission neutral Diagnostic
Ethernet Bus 12 (+)	B1A0B	Monitoring for a failure of the Ethernet Bus connected to the HDLM Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the	Upon receipt of Link status =Down for a specific port for a calibratable amount of time	<1 second	Vehicle Power Mode: VN Activation Conditions: Supply Voltage Virtual Network condition Diagnostic_ENABLE	= RUN COMM_ENABLE=HIGH = 9 - 16V = Any Virtual Network that the ECU participates in is active. # disabled	Continuosuly	Safety Non-MIL Emission neutral Diagnostic
Map Data Corrupted	B1BA5	Monitors for a failure of the updated map pushed to the HDLM Modue Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the	At startup, The updated map in memory fails the integrity check	Fault detected	Vehicle Power Mode: VN Activation Conditions: Supply Voltage Virtual Network condition Diagnostic_ENABLE	= RUN COMM_ENABLE=HIGH = 9 - 16V = Any Virtual Network that the ECU participates in is active. # disabled	The map age verification algorithm will RUN once on Power Up until it completes.	Safety Non-MIL Emission neutral Diagnostic
Map Information Not Updated	B2BA1	The map data is not up to date Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the downstream consumer.	(current date) - (last successful map update)	>= calibration attribute MaxMapAge (6 months)	Vehicle Power Mode: VN Activation Conditions: Supply Voltage Virtual Network condition Diagnostic_ENABLE	= RUN COMM_ENABLE=HIGH = 9 - 16V = Any Virtual Network that the ECU participates in is active. # disabled	The map age verification algorithm will RUN once on Power Up until it completes.	Safety Non-MIL Emission neutral Diagnostic
Invalid Data Received from External Object Calculating Module 1	U053B	Monitors for the intergrity of the data being received from the EOCM module	When the ECU has determined that the signal payload received has a failed safety, security (MAC), protection (PV) or continuous operation (ARC, Checksum) indication as per the signal status monitor	Fault detected	Vehicle Power Mode: VN Activation Conditions: Supply Voltage Virtual Network condition Diagnostic_ENABLE	= RUN COMM_ENABLE=HIGH = 9 - 16V = Any Virtual Network that the ECU participates in is active. # disabled	Continuosuly	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with Telematics Control Platform Module on Ethernet Bus	U1624	Monitoring for a failure of the communication with the TCP Module on Ethernet Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the	Upon receipt of Link status =Down for a specific port for a calibratable amount of time	<1 second	Vehicle Power Mode: VN Activation Conditions: Supply Voltage Virtual Network condition Diagnostic_ENABLE	= RUN COMM_ENABLE=HIGH = 9 - 16V = Any Virtual Network that the ECU participates in is active. # disabled	Continuosuly	Safety Non-MIL Emission neutral Diagnostic
Lost Communication with External Object Calculating Module 1 - Processor 1 on Ethernet Bus	U1625	Monitoring for a failure of the communication with the EOCM Module on Ethernet Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the	Upon receipt of Link status =Down for a specific port for a calibratable amount of time	<1 second	Vehicle Power Mode: VN Activation Conditions: Supply Voltage Virtual Network condition Diagnostic_ENABLE	= RUN COMM_ENABLE=HIGH = 9 - 16V = Any Virtual Network that the ECU participates in is active. # disabled	Continuosuly	Safety Non-MIL Emission neutral Diagnostic
Key Table Not Provisioned	U1960	The confirmed status for this DTC indicates that at least one Security Peripheral General Key must be provisioned. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the downstream consumer.	The Authoritative Counter Any single Key Slot Provision State Flag for Key 2 through to the final Key AND OBD Manufacturing Enable Counter ERC_KEY_EMPTY	= Max Value = 0 = 0 = TRUE	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SecurityPeripheralPerformanceDiagnosticPowerModeTime U196000_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event All of the previous conditions plus any one of the following: 1) Monitored continuously while CAN frames are being transmitted and received. 2) Checked at ECU power up. 3) Monitored whileRID_	9V < voltage < 16V = True >= 5 seconds = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received.	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Security Peripheral Performance - Performance or Incorrect Operation	U1961	The confirmed status for this DTC indicates that the Front Camera Module Low Content (FCM_LC) must be replaced due to an internal error. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the downstream consumer.	1) The security peripheral is considered to have failed if a request to the security peripheral cannot generate a Message Authentication Code (MAC) due to an internal error (not due to software timeouts). 2) The security peripheral is considered to have failed if a request to the security peripheral cannot verify a Message Authentication Code (MAC) due to an internal error (not due to software timeouts).	= Fault Detected	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SecurityPeripheralPerformanceDiagnosticPowerModeTime U196192_ENABLE Transport Mode Time since power up reset or running reset or under voltaae or over_	9V < voltage < 16V = True >= 5 seconds = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received	Safety Non-MIL Emission neutral Diagnostic
Unable To Authenticate Serial Data Message	U1962	Monitors incoming message authentification code and compares with the expected based on message source. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using controller provided data. The default action depends on the downstream consumer. It should noted not all devices with incorrect authentication will set the default action - only applies to adaptive cruise critical devices.	A Message Authentication Code results in failed verification for a calibratable number of consecutive verification attempts for a specific key slot number of consecutive failures failures	>k_ERRH_C_FailedAuthenticationCounter	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SerialDataAuthentificationPowerModeTime Fault Code U196192 U196200_ENABLE Transport Mode Time since power up reset or running reset or undAr vnltaciA or ovor_	9V < voltage < 16V = True >= 2 seconds = Inactive = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received	Safety Non-MIL Emission neutral Diagnostic
Control Module		General Checksum Failure	Internal Front Camera Module Low Content (FCM_LC) Memory Checksum Failure Detected.	= Fault Detected	Vehicle Supply Voltage U300041_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		General Memory Failure	General Memory Failure Detected	= Fault Detected	Vehicle Supply Voltage U300042_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Special Memory Failure	At startup, error in file server mount file Unable to perform file read/write operation on file system. After four rpfripci tn rpprl/writp pH rptiirn fail_	= Fault Detected	Vehicle Supply Voltage U300043_ENABLE	9V < voltage < 16V = Enabled	At Start-up	Safety Non-MIL Emission neutral Diagnostic
		Data Memory Failure	a data (or working) memory failure for embedded systems using FLASH RAM memory has occurred	= Fault Detected	Vehicle Supply Voltage U300044_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
	U3000	Program Memory Failure	working memory failure for embedded systems using ROM memory has occurred	= Fault Detected	Vehicle Supply Voltage U300045_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Calibration / Parameter Memory Failure	In case a Data Flash memory failure is detected.	= Fault Detected	Vehicle Supply Voltage U300046_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Watchdog and Safety Microcontroller Failure	In case a Data Flash memory failure is detected.	= Fault Detected	Vehicle Supply Voltage U300046_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Supervision Software Failure	Failure of Safety MCU Software	= Fault Detected	Vehicle Supply Voltage U300048_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Internal Electronic Failure	Front Camera Module Low Content (FCM_LC) internal circuit micro (Not Image Processing Engine) is detected - BIST Fail - Registier Check Error - Internal Voltage Out of Range - Internal Comm Error	= Fault Detected	Vehicle Supply Voltage U300049_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Control Module Over Temperature	VPM internal temperature above threshold	75C	Diagnostic_ENABLE = Enabled	Vehicle Power Mode condition: OFF, ACCESSORY, RUN ECU Operational nnnrlitinn■Q-IAu	Continuously	Safety Non-MIL Emissions Neutral Diagnostic
		Not Programmed	Default Calibrations Stored. This is checked by verifying a specific signature is written at calibration section	Memory location is Set to OxFF or Calibration signature is not present	Vehicle Power Mode: Supply Voltage Virtual Network condition Diagnostic_ENABLE	= RUN = 9 - 16V = Any Virtual Network that the ECU participates in is active. # disabled	Once at power-up	Safety Non-MIL Emission neutral Diagnostic
		Missing Calibration	Indicates faults related to operational software, calibrations, and options	= Fault Detected	Vehicle Supply Voltage U300054_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Invalid Incompatible Software Componet	Incorrect software program	= Fault Detected	Vehicle Supply Voltage U300057_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic
		Signal Compare Failure	Signal comparison has failed within contrller	= Fault Detected	Vehicle Supply Voltage U300062_ENABLE	9V < voltage < 16V = Enabled	Continuously	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Voltage	U3003	Battery Voltage - Circuit Voltage Below Threshold. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using front camera information will occur. The default action depends on the downstream consumer. Applies for all diagnostics listed under U3003.	Front Camera Module Low Content (FCM_LC) supply voltage (Vsup)	< 9.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active. U300316_ENABLE	> 5 seconds = Enabled	3.000 Seconds	Safety Non-MIL Emission neutral Diagnostic
		Battery Voltage - Circuit Voltage Above Threshold	Front Camera Module Low Content (FCM_LC) supply voltage (Vsup)	> 16.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active. U300317_ENABLE	> 5 seconds = Enabled	3.000 Seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication CAN Bus 8 Off	U007E	This DTC monitors for a BUS 8 off condition Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	CAN driver indicates a bus off condition has occurred	= Fault detected	Vehicle Supply Voltage PNC_ActiveTxPDUEnable U007E00_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event Power Mode OBD Manufacturing Enable Counter	9V< voltage < 16V = True = Enabled = Inactive > 5 seconds = Run = 0	Monitored continuously while CAN frames are being transmitted and received Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
Invalid Data Received from Body Control Module	U0422	Detects invalid data errors in messages received from the Body Control Module (BCM) e.g. alive rolling count, checksum, MAC The emissions neutral default action (described below) will only occur if both U0422 and U0477 are triggered at the same time, otherwise the LRR will function normally. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The following messages are monitored. This code sets if a message fails any of these criteria for the timeout period SysPwrMode_Prtctd_MSG	= 0.62500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturing Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the Body Control Module (BCM) Fault maturation time is 0.62500 seconds	Safety Non-MIL Emission neutral Diagnostic
Invalid Data Received from Central Gateway Module	U0447	Detects invalid data errors in messages received from the Central Gateway Module (CGM) e.g. alive rolling count, checksum, MAC The emissions neutral default action (described below) will only occur if both U0422 and U0477 are triggered at the same time, otherwise the LRR will function normally. Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The following messages are monitored. This code sets if a message fails any of these criteria for the timeout period BkupSysPwrMode_Prtctd_MSG	= 0.625 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturing Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the Central Gateway Module (CGM) Fault maturation time is 0.62500 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received from External Object Calculating Module 1	U053B	Detects invalid data errors in messages received from the External Object Calculating Module (EOCM) e.g. alive rolling count Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The following messages are monitored. This code sets if a message fails any of these criteria for the timeout period HstVehPathParms_Prtctd_MSG	= 0.02500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the External Object Calculation Module 1 Fault maturation time is 0.02500 seconds	Safety Non-MIL Emission neutral Diagnostic
Lost Communication with External Object Calculating Module 1 on CAN Bus 8	U1616	This DTC monitors for a loss of communication with the External Object Calculation Module on Can Bus 8 Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The following messages are monitored for late arrival and this code sets if a message times out HstVehPathParms_Prtctd_MSG	= 0.02500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable U161600_ENABLE Time since power up reset or running reset or under voltage or over voltage condition event DTC U007E00 OBD Manufacturer Enable Counter	9V < voltage < 16V = True = Enabled > 5 seconds = Inactive = 0	Monitored continuously while CAN frames are being transmitted and received Fault maturation time is 0.02500 seconds	Safety Non-MIL Emission neutral Diagnostic
Key Table Not Provisioned	U1960	The confirmed status for this DTC indicates that at least one Security Peripheral General Key must be provisioned Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The Authoritative Counter Any single Key Slot Provision State Flag for Key 2 through to Key 20 AND OBD Manufacturing Enable Counter ERCKEYEMPTY	= Max Value = 0 = 0 = TRUE	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SecurityPeripheralPerformance DiagnosticPowerModeTime U196000_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event All of the previous conditions plus any one of the following: 1) Monitored continuously while CAN frames are being transmitted and received. 2) Checked at ECU power up. 3) Monitored whileRID 0x0200; Provision Security Peripheral General Keys is being executed	9V < voltage < 16V = True >= 5 seconds = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Security Peripheral Performance - Performance or Incorrect Operation	U1961	The confirmed status for this DTC indicates that the radar must be replaced due to an internal error Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The two following conditions lead to this failure: 1) The security peripheral is considered to have failed if a request to the security peripheral cannot generate a Message Authentication Code (MAC) due to an internal error (not due to software timeouts). 2) The security peripheral is considered to have failed if a request to the security peripheral cannot verify a Message Authentication Code (MAC) due to an internal error (not due to software timeouts). These failures are detected by monitoring the following conditions updated by the security peripheral ERC function: ERCKEYJN VALID ERC_BUSY ERC_GENERAL_FAILURE ERC_KEY_NOT_AVAILABLE ERC_KEY_UPDATE_ERROR ERC_KEY_WRITE_PROTECTED ERC_MEMORY_FAILURE ERC_NO_DEBUGGING ERC_NO_SECURE_BOOT ERC_SEQUENCE_ERROR	= Fault detected For all ERC errors: = True	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SecurityPeripheralPerformance DiagnosticPowerModeTime U196191_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event	9V < voltage < 16V = True >= 5 seconds = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received DTC matures instantly	Safety Non-MIL Emission neutral Diagnostic
Unable To Authenticate Serial Data Message	U1962	Monitors incoming message authentification code and compares with the expected based on message source Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer. It should noted not all devices with incorrect authentication will set the default action - only applies to adaptive cruise critical devices.	A Message Authentication Code results in failed verification for a calibratable number of consecutive verification attempts for a specific key slot number of consecutive failures failures	> k_ERRH_C_FailedAuthenticationCounter	Vehicle Supply Voltage PNC_ActiveTxPDUEnable AND k_SerialDataAuthentificationPower ModeTime Fault Code U196192 U196200_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event	9V < voltage < 16V = True >= 2 seconds = Inactive = Enabled = Inactive > 5 seconds	Monitored continuously while CAN frames are being transmitted and received	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Radar Internal/Programming failures		Control Module General Failure - No Sub Type Information available. Internal voltage problems, problems with the RF, ATIC or MCU power supply. Upon fault detection for any fault under U3000, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	Radar has an internel supply voltage error or minimum excitation level magnet lost. This DTC is set If the following voltages are measured to be out of range. Voltage UBATT (with CAT2 reaction) Voltage UBATT Warn Level (UBATT_CHECK_CAT3) Voltage 5V0_SMPS Voltage 3V6_SMPS Voltage ADC Bandgap 0 Voltage ADC Bandgap 1	< 5.665V or > 27.811V < 8.575V or > 16.503V < 4.749V or > 5.240V < 3.415V or > 3.776V < 1.183V or > 1,255V < 1.183V or > 1 255V	Vehicle Supply Voltage U300000_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU participates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module General Checksum Failure	Radar Memory Checksum Failure occurs. A CRC (cyclic redundance check) is performed on NVM (non-volatile memory) and a fault is triggered if the calculation does not validate the information stored in NVM.	= Fault detected	Vehicle Supply Voltage U300041_ENABLE Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU participates in is active	9V < voltage < 16V = Enabled > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module General Memory Failure. Indicates a serious Memory issue; i.e. a failure within the hardware or information is lost that cannot be recovered. If the non-volatile memory (NVM) component reports read errors regarding the integrity of the data or if data is corrupted or if certain read, write, erase procedures fail.	The memory component triggers various error DEMs (diagnostic event monitors) to determine a failure. Failures can be discovered during various memory operations in the flash. Common failures include - memory erase/ read/ write errors. Comparison failures, wrong block IDs and unexpected flash IDs	= Fault detected	Vehicle Supply Voltage U300042_ENABLE Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU participates in is active	9V < voltage < 16V = Enabled > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Control Module Special Memory Failure. Proposed to be a mild memory issue, i.e. A failure occurs in which the radar can recover and if data is lost, the data can be recovered. For example this can trigger if a redundant block is lost.	The NVM component triggers various error DEMs (diagnostic event managers) to determine a failure. Common faults include - loss of redundancy, attempted writes to protected memory.	= Fault detected	Vehicle Supply Voltage U300043_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active_	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Internal Electronic Failure. Consists of general internal hardware issues that are not related to memory, temperature or voltage. This diagnostic covers issues with the RF (radio frequency) chirps, resets, DMA (direct memory access) bus failures, stack overflows, hardware timeouts, watchdog issues etc.	Radar internal circuit failure occurs such as: 1) Multiple random access memory errors 2) Watchdog errors These failures are mostly related to issues with the RF (radio frequency) board triggered from the RFCOM (radio frequency communication) component, the driver for the high frequency. Can be caused also by hardware timeouts, failures in the MMIC (millimeter integrated circuit - radio frequency chip), internal MCU (microprocessor control unit) problems like DMA (direct memory access) bus failures or register failures.	= Fault detected	Vehicle Supply Voltage U300049_ENABLE Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU participates in is active	9V < voltage < 16V = Enabled > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Over Temperature	Radar RF internal temperature is above threshold such that it cannot operate effectively.	= Fault detected	Vehicle Supply Voltage U30004B_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active_	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
	U3000	Control Module not Programmed	Sensor operating software not sucessfully flashed on to the microcontroller	= Fault detected	Vehicle Supply Voltage U300051_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Missing Calibration. Triggers if the APAR application parameters)/PPAR (production parameters) is missing from the software.	Radar has not been calibrated or Radar calibration process failed indicated by: k_default_calibration	= True	Vehicle Supply Voltage U300054_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Not Configured. Sensor has not yet completed a successful aiming process.	Radar sensor address has not been learned and locked in. Additional the following values have not yet been aimed and provided to the radar: azmiuth (left and right), elevation (high, low)	= Fault detected	Vehicle Supply Voltage U300055_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Control Module Invalid Incompatible Configuration. APAR (application parameters) Calibration values are outside the valid calibration range.	Control Module or System Configuration not valid such that calibration values are outside the valid calibration range. On initialization, every calibration is range checked to be within specified high and low range limits. If one of these values are out of range, then the APAR (application parameters) is rejected and a default APAR is loaded instead.	= Fault detected	Vehicle Supply Voltage U300056_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Invalid Incompatible Software Component. The calibration table doesn't align properly and is no longer compatible with the OP software.	Software component not compatible with detected hardware/software. For the calibration table, it's checked with a "versioning" system. Another calibration was added to the APAR (application parameters) as a version number. This number increments when the table is modified. The SW has a defined version number as well. If these two match, then it's known that the SW is compatible with the APAR and if they don't this fault is triggered.	= Fault detected	Vehicle Supply Voltage U300057_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	0.10000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Wrong mounting position - the radar is not mounted correctly	Absolute value of Angle Misalignment Any of the following bits of Active Fault are set:	> k_Radar_Misalignment_Out_Of_Range alignment_mode horizontal_alignment_out_of_range vertical_alignment_out_of_range alignment_routine_failed_fault	Vehicle Supply Voltage U300076_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	0.10000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Incorrect Assembly - This DTC indicates a repositioned sensor or wiring fault.	Learned address and current address position mismatch	Active_Fault.bit.sensor_addr_unstable_fault = TRUE	Vehicle Supply Voltage U300095_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	0.10000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Component or System Operation Obstructed or Blocked. This is caused by a radar algorithm detecting blockage on the sensor, keeping it from detecting objects.	The operation of a component is prevented by an obstruction which trigers this fault. This is detected if the immediate environment of the radar does not change for a given period of time, the radar determines that it is blocked and a fault is detected.	= Fault detected	Vehicle Supply Voltage U300097_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Component or System Operating Condition. For this DTC, it is monitoring the RF (radio frequency) and Internal MCU (microprocessor control unit) temperatures.	Radar internal temperature at threshold for the RF and internal MCU	= Fault detected	Vehicle Supply Voltage U30009A_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Radar Power Circuit	U3003	Battery Voltage - Circuit Voltage Below Threshold Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer. This applie to high and low voltage diagnostics	Radar supply voltage (Vsup)	<9.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active. U300316_ENABLE	> 5 seconds = Enabled	3.000 Seconds	Safety Non-MIL Emission neutral Diagnostic
		Battery Voltage - Circuit Voltage Above Threshold	Radar supply voltage (Vsup)	> 16.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active U300317 ENABLE	> 5 seconds = Enabled	3.000 Seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Multi Axis Accelerometer Performance	C006A	This sub type is used for failures where the control module has detected that the component performance is outside its expected range or operating in an incorrect way. Upon fault detection, the SDM will flag IMU data is Invalid or Uncorrelated. Upstream consumers such as adaptive cruise control will disable based on these flags.	One of the following IMU (Inertial Measuement Unit) failures occurs within the SDM (Sensing and Diagnostic module) 1) Sensor 1 Yaw Data 2) Sensor 2 Yaw Data 3) Sensor 1 Longitudinal Acceleration Data 4) Sensor 2 Longitudinal Acceleration Data 5) Sensor 1 Lateral Acceleration Data 6) Sensor 2 Lateral Acceleration Data For 7,8,9 a correlation algorithm compares data from 2 separate IMUs (Inertial Measurement Unit) and fails if the sensor data sample by sample comparrisons are outside of tolerance 7) Yaw Data Correlation Failure YRP_YawRateCorrAuth 8) Longitudinal Acceleration Correlation Failure LLDP_LongAccelSnsrCorrStsAuth 9) Lateral Acceleration Correlation Failure LLDP_LatAccelSnsrCorrStsAuth	(1)to (6) = Invalid (7) to (9) = $03 (Uncorrelated)	Vehicle Supply Voltage C006A00_ENABLE	9V< voltage < 16V = Enabled	Within 0.05000 seconds	Safety Non-MIL Emission Neutral Diagnostic
Control Module Communication CAN Bus 1 Off	U0075	This DTC monitors for a BUS 1 off condition. Upon fault detection, the SDM will flag IMU data is Invalid or Uncorrelated. Upstream consumers such as adaptive cruise control will disable based on these flags.	CAN driver indicates a bus off condition has occurred	= Fault Detected	Vehicle Supply Voltage PNC_ActiveTxPDUEnable U007500_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event Power Mode	9V< voltage < 16V = True = Enabled = Inactive > 5 seconds = Run	Monitored continuously while CAN frames are being transmitted and received	Safety Non-MIL Emission Neutral Diagnostic
Sensing and Diagnostic Module Internal/Programming failures	U3000	SMI7xx - SPI interprocessor communications - open circuit. Detected by the SPI software. Diagnostic runs at start-up and every 0.001 s Upon fault detection, the SDM will flag IMU data is Invalid or Uncorrelated. Upstream consumers such as adaptive cruise control will disable based on these flags. Applies to all DTC within U3000	SPI diagnostic software detects an open circuit	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Drive/Predrive =6.0 < V< 18.0	0.003 seconds	Safety Non-MIL Emission Neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		SMI7xx - Chip external supply - open circuit. Detected by the voltage supply diagnostic. Diagnostic runs every 0.001 s	Voltage supply detects an open circuit	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Drive =6.0 < V< 18.0	0.03 seconds	
		SMI7xx - SPI interprocessor communications - short circuit. Detected by the SPI software. Diagnostic runs at start-up and every 0.001 s	SPI diagnostic software detects an short circuit	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Drive/Predrive =6.0 < V < 18.0	0.003 seconds	
		SMI7xx - Chip external supply - short circuit. Detected by the voltage supply diagnostic. Diagnostic runs every 0.001 s	Voltage supply detects an short circuit	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Drive =6.0 <V< 18.0	0.03 seconds	
		SMI7xx - Chip external supply - Out-of-Range. Detected by the voltage supply diagnostic. Diagnostic runs every 0.001 s	Voltage supply detects voltage out of range	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Drive =6.0 <V< 18.0	0.03 seconds	
		SMI7xx - Drift or oscillations or Offset in the valid range	1) Error in Calculating IMU Offset OR 2) When in drive mode if the saturation thresholds out of range for a period of time (3 seconds) OR 3) When in drive mode, a failure will be detected by the Level 1 diagnostic comparison of the primary and secondary sensor data.	For 1) and 3) detected by SMI7xx Software. For 2) X Accel >1g Y Accel > 1g Yaw >40 deg/s	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Drive =6.0 <V< 18.0	1) 1.042 s 2) 3 s 3) 0.04 s	
		SMI7xx - Values stuck in valid range	IMU and Roll - In PDC, sensor self-tests are performed and will set an error condition if a failure is detected	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Predrive =6.0 <V< 18.0	3 occurances - diagnostic operates at start-up	
			IMU - When in drive mode, a failure will be detected by the Level 1 diagnostic comparison of the primary and secondary sensor data.	= Fault Detected	DTC Calibration SDM Power Mode ECU Status	= Enabled = Run/Propulsion = Drive	0.04 s	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		System Communication SPI - Aged data (delay, repeated data, re-sequencing)	IMU and Roll - In PDC, sensor self-tests are performed and will set an error condition if a failure is detected	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Predrive =6.0 < V< 18.0	3 occurances - diagnostic operates at start-up	
			IMU - When in drive mode, a failure will be detected by the Level 1 diagnostic comparison of the primary and secondary sensor data.	= Fault Detected	DTC Calibration SDM Power Mode ECU Status	= Enabled = Run/Propulsion = Drive	0.04 s	
		System Communication SPI - Corrupted Data (incorrect data, insertion of data, re-sequencing)	Corrupted SPI data errors are detected by SPI diagnostics, including CRC and address diagnostics, internal to the sensor as well as in application software. If a SPI error is detected, an error condition is set.	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Predrive/Drive =6.0 < V < 18.0	0.03 s	
		System Communications SPI - Loss of Data	Sensor data is monitored for availability. If it is unavailable, an error condition will be set.	No data detected for fault threshold	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Predrive/Drive =6.0 <V< 18.0	0.03 s	
		System Communications SPI - 'Interrupted data (partial data transmit or no data transmit)	Interrupted SPI data errors are detected by SPI diagnostics, including CRC and address diagnostics, internal to the sensor as well as in application software. If a SPI error is detected, an error condition is set.	= Fault Detected	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Predrive/Drive =6.0 <V< 18.0	0.03 s	
		SMI7xxx Power Supply	Under Voltage - The sensor monitors Vcc for under voltage and will set an error condition if a failure is detected.	< 3.13 V	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Drive =6.0 <V< 18.0	0.03 s	
			Over Voltage - The sensor monitors Vcc for over voltage and will set an error condition if a failure is detected.	>3.47 V	DTC Calibration SDM Power Mode ECU Status Supply Voltage	= Enabled = Run/Propulsion = Drive =6.0 <V< 18.0	0.03 s	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Supply Voltage	U3003	Battery Voltage - Circuit Voltage Below Threshold The DTC code will set at 9 V, however the emissions neutral default action of stopping tramissions of data, and disabling adaptive cruise control will not occur until ~5V, or whenever the SDM can no longer send CAN messages	Sensing and Diagnostic Module (SDM) supply voltage (Vsup)	<9.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active. U300316_ENABLE	> 5 seconds = Enabled	3.000 Seconds	Safety Non-MIL Emission Neutral Diagnostic
		Battery Voltage - Circuit Voltage Above Threshold	Sensing and Diagnostic Module (SDM) supply voltage (Vsup)	> 16.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active. U300317_ENABLE	> 5 seconds = Enabled	3.000 Seconds	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Communication CAN Bus 8 Off	U007E	This DTC monitors for a BUS 8 off condition Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	CAN driver indicates a bus off condition has occurred	= Fault detected	Vehicle Supply Voltage PNC_ActiveTxPDUEnable U007E00_ENABLE Transport Mode Time since power up reset or running reset or under voltage or over voltage condition event Power Mode OBD Manufacturing Enable Counter	9V< voltage < 16V = True = Enabled = Inactive > 5 seconds = Run = 0	Monitored continuously while CAN frames are being transmitted and received Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
Invalid Data Received from Body Control Module	U0422	Detects invalid data errors in messages received from the Body Control Module (BCM) e.g. alive rolling count, checksum, MAC Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The following messages are monitored. This code sets if a message fails any of these criteria for the timeout period SysPwrMode_Prtctd_MSG	= 0.62500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturing Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the Body Control Module (BCM) Fault maturation time is 0.62500 seconds	Safety Non-MIL Emission neutral Diagnostic
Invalid Data Received from Central Gateway Module	U0447	Detects invalid data errors in messages received from the Central Gateway Module (CGM) e.g. alive rolling count, checksum, MAC Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The following messages are monitored. This code sets if a message fails any of these criteria for the timeout period BkupSysPwrMode_Prtctd_MSG	= 0.625 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturing Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the Central Gateway Module (CGM) Fault maturation time is 0.62500 seconds	Safety Non-MIL Emission neutral Diagnostic
Invalid Data Received from External Object Calculating Module 1	U053B	Detects invalid data errors in messages received from the External Object Calculating Module (EOCM) e.g. alive rolling count Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The following messages are monitored. This code sets if a message fails any of these criteria for the timeout period HstVehPathParms_Prtctd_MSG	= 0.02500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable Time since power up reset or running reset or under voltage or over voltage condition event OBD Manufacturer Enable Counter	9V < voltage < 16V = True > 5 seconds = 0	Dependent upon receipt of each monitored signal from the External Object Calculation Module 1 Fault maturation time is 0.02500 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with External Object Calculating Module 1 on CAN Bus 8	U1616	This DTC monitors for a loss of communication with the External Object Calculation Module on Can Bus 8 Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	The following messages are monitored for late arrival and this code sets if a message times out HstVehPathParms_Prtctd_MSG	= 0.02500 seconds (timeout)	Vehicle Supply Voltage PNC_ActiveTxPDUEnable U161600_ENABLE Time since power up reset or running reset or under voltage or over voltage condition event DTC U007E00 OBD Manufacturer Enable Counter	9V < voltage < 16V = True = Enabled > 5 seconds = Inactive = 0	Monitored continuously while CAN frames are being transmitted and received Fault maturation time is 0.02500 seconds	Safety Non-MIL Emission neutral Diagnostic
Radar Internal/Programming failures		Control Module General Failure - No Sub Type Information available. Internal voltage problems, problems with the RF, ATIC or MCU power supply. Upon fault detection for any fault under U3000, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer.	Radar has an internel supply voltage error or minimum excitation level magnet lost. This DTC is set If the following voltages are measured to be out of range. Voltage UBATT (with CAT2 reaction) Voltage UBATT Warn Level (UBATT_CHECK_CAT3) Voltage 5V0_SMPS Voltage 3V6_SMPS Voltage ADC Bandgap 0 Voltage ADC Bandgap 1	< 5.665V or > 27.811V < 8.575V or > 16.503V < 4.749V or > 5.240V < 3.415V or > 3.776V < 1.183V or > 1,255V < 1.183V or > 1.255V	Vehicle Supply Voltage U300000_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU participates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module General Checksum Failure	Radar Memory Checksum Failure occurs. A CRC (cyclic redundance check) is performed on NVM (non-volatile memory) and a fault is triggered if the calculation does not validate the information stored in NVM.	= Fault detected	Vehicle Supply Voltage U300041_ENABLE Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU participates in is active	9V < voltage < 16V = Enabled > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Control Module General Memory Failure. Indicates a serious Memory issue; i.e. a failure within the hardware or information is lost that cannot be recovered. If the non-volatile memory (NVM) component reports read errors regarding the integrity of the data or if data is corrupted or if certain read, write, erase procedures fail.	The memory component triggers various error OEMs (diagnostic event monitors) to determine a failure. Failures can be discovered during various memory operations in the flash. Common failures include - memory erase/ read/ write errors. Comparison failures, wrong block IDs and unexpected flash IDs	= Fault detected	Vehicle Supply Voltage U300042_ENABLE Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Special Memory Failure. Proposed to be a mild memory issue, i.e. A failure occurs in which the radar can recover and if data is lost, the data can be recovered. For example this can trigger if a redundant block is lost.	The NVM component triggers various error DEMs (diagnostic event managers) to determine a failure. Common faults include - loss of redundancy, attempted writes to protected memory.	= Fault detected	Vehicle Supply Voltage U300043_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Internal Electronic Failure. Consists of general internal hardware issues that are not related to memory, temperature or voltage. This diagnostic covers issues with the RF (radio frequency) chirps, resets, DMA (direct memory access) bus failures, stack overflows, hardware timeouts, watchdog issues etc.	Radar internal circuit failure occurs such as: 1) Multiple random access memory errors 2) Watchdog errors These failures are mostly related to issues with the RF (radio frequency) board triggered from the RFCOM (radio frequency communication) component, the driver for the high frequency. Can be caused also by hardware timeouts, failures in the MMIC (millimeter integrated circuit - radio frequency chip), internal MCU (microprocessor control unit) problems like DMA (direct memory access) bus failures or register failures.	= Fault detected	Vehicle Supply Voltage U300049_ENABLE Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU participates in is active	9V < voltage < 16V = Enabled > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Control Module Over Temperature	Radar RF internal temperature is above threshold such that it cannot operate effectively.	= Fault detected	Vehicle Supply Voltage U30004B_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active_	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module not Programmed	Sensor operating software not sucessfully flashed on to the microcontroller	= Fault detected	Vehicle Supply Voltage U300051_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active_	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
	U3000	Control Module Missing Calibration. Triggers if the APAR application parameters)/PPAR (production parameters) is missing from the software.	Radar has not been calibrated or Radar calibration process failed indicated by: k_default_calibration	= True	Vehicle Supply Voltage U300054_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active_	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Control Module Not Configured. Sensor has not yet completed a successful aiming process.	Radar sensor address has not been learned and locked in. Additional the following values have not yet been aimed and provided to the radar: azmiuth (left and right), elevation (high, low)	= Fault detected	Vehicle Supply Voltage U300055_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Invalid Incompatible Configuration. APAR (application parameters) Calibration values are outside the valid calibration range.	Control Module or System Configuration not valid such that calibration values are outside the valid calibration range. On initialization, every calibration is range checked to be within specified high and low range limits. If one of these values are out of range, then the APAR (application parameters) is rejected and a default APAR is loaded instead.	= Fault detected	Vehicle Supply Voltage U300056_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Invalid Incompatible Software Component. The calibration table doesn't align properly and is no longer compatible with the OP software.	Software component not compatible with detected hardware/software. For the calibration table, it's checked with a "versioning" system. Another calibration was added to the APAR (application parameters) as a version number. This number increments when the table is modified. The SW has a defined version number as well. If these two match, then it's known that the SW is compatible with the APAR and if they don't this fault is triggered.	= Fault detected	Vehicle Supply Voltage U300057_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	0.10000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Wrong mounting position - the radar is not mounted correctly	Absolute value of Angle Misalignment Any of the following bits of Active Fault are set:	> k_Radar_Misalignment_Out_Of_Range alignment_mode horizontal_alignment_out_of_range vertical_alignment_out_of_range alignment_routine_failed_fault	Vehicle Supply Voltage U300076_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	0.10000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Incorrect Assembly - This DTC indicates a repositioned sensor or wiring fault.	Learned address and current address position mismatch	Active_Fault.bit.sensor_addr_unstable_fault = TRUE	Vehicle Supply Voltage U300095_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	0.10000 seconds	Safety Non-MIL Emission neutral Diagnostic
		Control Module Component or System Operation Obstructed or Blocked. This is caused by a radar algorithm detecting blockage on the sensor, keeping it from detecting objects.	The operation of a component is prevented by an obstruction which trigers this fault. This is detected if the immediate environment of the radar does not change for a given period of time, the radar determines that it is blocked and a fault is detected.	= Fault detected	Vehicle Supply Voltage U300097_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		Control Module Component or System Operating Condition. For this DTC, it is monitoring the RF (radio frequency) and Internal MCU (microprocessor control unit) temperatures.	Radar internal temperature at threshold for the RF and internal MCU	= Fault detected	Vehicle Supply Voltage U30009A_ENABLE OBD Manufacturing Enable Counter Power Mode = Run Time since power up reset or running reset or under voltage or over voltage condition event ECU_COMM_Active Any Partial Network that the ECU oarticioates in is active_	9V < voltage < 16V = Enabled = 0 > 5 seconds > 5 seconds = True	Checked every 0.01000 seconds	Safety Non-MIL Emission neutral Diagnostic
Radar Power Circuit	U3003	Battery Voltage - Circuit Voltage Below Threshold Upon fault detection, the emissions neutral default action of either 1) disabling adaptive cruise control, 2) or no longer using radar information will occur. The default action depends on the downstream consumer. This applie to high and low voltage diagnostics	Radar supply voltage (Vsup)	<9.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active. U300316_ENABLE	> 5 seconds = Enabled	3.000 Seconds	Safety Non-MIL Emission neutral Diagnostic
		Battery Voltage - Circuit Voltage Above Threshold	Radar supply voltage (Vsup)	> 16.0 +/-0.5 volts	Vehicle Power Mode = Run Virtual Network Condition: Any Partial Network that the ECU participates in is active U300317 ENABLE	> 5 seconds = Enabled	3.000 Seconds	Safety Non-MIL Emission neutral Diagnostic

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Longitudinal Acceleration Sensor Performance	C0552	Controller specific analog circuit diagnoses the raw longitudinal acceleration signal rationalized against the TOSS vehicle speed acceleration. The diagnostic monitor can be designed to detect an invalid longitudinal acceleration signal based on the TOSS vehicle speed windows and TOSS vehicle speed acceleration, 4 windows can be enabled. The delta between the TOSS vehicle speed acceleration and longitudinal acceleration signal is taken within each window to verify the delta is small, no failure indicated, or the delta is large indicating the longitudinal acceleration signal is in error. Emission neutral default state sets lateral longitudinal acceleration signal = 0.0 g.	ABS(TOSS vehicle speed acceleration - raw longitudinal acceleration signal) update raw longitudinal acceleration signal region 1 fail time, 50 millisecond update rate	> 0.0800 g	battery voltage run crank voltage diagnostic monitor enable region 1 specific enable update raw lateral longitudinal acceleration signal stablity time: TOSS vehicle speed TOSS vehicle speed acceleration automatic transmission is clutch to clutch OR dual clutch high side drive 1 enable high side drive 2 enable diagnsotic fault sequence gear active P0716 fault active P0716 test fail this key on P0717 fault active P0717 test fail this key on P07BF fault active P07BF test fail this key on P07C0 fault active P07C0test fail this key on attained gear ABS(raw longitudinal acceleration signal) AND ABS(raw longitudinal acceleration signal) update region 1 sample time: brake pedal position engine torque TOSS vehicle speed acceleration TOSS vehicle speed TOSS vehicle speed	> 11.00 volts > 11.00 volts = 1 Boolean = 1 Boolean > 15.0 KPH < 0.5300 g = TRUE = TRUE = TRUE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1st thru 10th > 0.5300 g < 3.8500 g < 0.70 % > 50.0 Nm > 0.0800 g > 2.0 KPH < 120.0 KPH	raw lateral longitudinal acceleration signal stability time> 10.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate region 1 fail time > 4.0 seconds out of region 1 sample time > 5.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					ABS(raw longitudinal acceleration signal) update sample time U0073 fault active U0073 test fail this key on DTCs not fault active	< 0.5300 g = FALSE = FALSE VehicleSpeedSensor_FA VehicleSpeedSensorError		
			ABS(TOSS vehicle speed acceleration - raw longitudinal acceleration signal) update raw longitudinal acceleration signal region 2 fail time, 50 millisecond update rate	> 0.0000 g	battery voltage run crank voltage diagnostic monitor enable region 2 specific enable update raw lateral longitudinal acceleration signal stablity time: TOSS vehicle speed TOSS vehicle speed acceleration automatic transmission is clutch to clutch OR dual clutch high side drive 1 enable high side drive 2 enable diagnsotic fault sequence gear active P0716 fault active P0716 test fail this key on P0717 fault active P0717 test fail this key on P07BF fault active P07BF test fail this key on P07C0 fault active P07C0test fail this key on attained gear ABS(raw longitudinal acceleration signal) AND ABS(raw longitudinal acceleration signal)	> 11.00 volts > 11.00 volts = 1 Boolean = 0 Boolean > 15.0 KPH < 0.5300 g = TRUE = TRUE = TRUE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1st thru 10th > 0.5300 g < 3.8500 g	raw lateral longitudinal acceleration signal stability time > 10.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					update region 2 sample time: brake pedal position engine torque TOSS vehicle speed acceleration TOSS vehicle speed TOSS vehicle speed ABS(raw longitudinal acceleration signal) update sample time U0073 fault active U0073 test fail this key on DTCs not fault active	 < 0.70 % > 80.0 Nm > 0.1500 g > 0.0 KPH < 0.0 KPH < 0.5300 g = FALSE = FALSE VehicleSpeedSensor_FA VehicleSpeedSensorError	region 2 fail time > 75.0 seconds out of region 2 sample time > 120.0 seconds, 50 millisecond update rate	
			ABS(TOSS vehicle speed acceleration - raw longitudinal acceleration signal) update raw longitudinal acceleration signal region 3 fail time, 50 millisecond update rate	> 0.0000 g	battery voltage run crank voltage diagnostic monitor enable region 3 specific enable update raw lateral longitudinal acceleration signal stablity time: TOSS vehicle speed TOSS vehicle speed acceleration automatic transmission is clutch to clutch OR dual clutch high side drive 1 enable high side drive 2 enable diagnsotic fault sequence gear active P0716 fault active P0716 test fail this key on P0717 fault active P0717 test fail this key on P07BF fault active P07BF test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = 0 Boolean > 15.0 KPH < 0.5300 g = TRUE = TRUE = TRUE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE	raw lateral longitudinal acceleration signal stability time > 10.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					P07C0 fault active P07C0test fail this key on attained gear ABS(raw longitudinal acceleration signal) AND ABS(raw longitudinal acceleration signal) update region 3 sample time: brake pedal position engine torque ABS(TOSS vehicle speed acceleration) TOSS vehicle speed ABS(raw longitudinal acceleration signal) update sample time U0073 fault active U0073 test fail this key on DTCs not fault active	= FALSE = FALSE = 1st thru 10th > 0.5300 g < 3.8500 g < 0.70 % > 80.0 Nm < 0.1000 g > 0.0 KPH < 0.5300 g = FALSE = FALSE VehicleSpeedSensor_FA VehicleSpeedSensorError	region 3 fail time > 75.0 seconds out of region 3 sample time > 120.0 seconds, 50 millisecond update rate	
			ABS(TOSS vehicle speed acceleration - raw longitudinal acceleration signal) update raw longitudinal acceleration signal region 4 fail time, 50 millisecond update rate	> 0.1700 g	battery voltage run crank voltage diagnostic monitor enable region 3 specific enable update raw lateral longitudinal acceleration signal stablity time: TOSS vehicle speed TOSS vehicle speed acceleration automatic transmission is clutch to clutch OR dual clutch high side drive 1 enable high side drive 2 enable	> 11.00 volts > 11.00 volts = 1 Boolean = 1 Boolean > 15.0 KPH < 0.5300 g = TRUE = TRUE = TRUE	raw lateral longitudinal acceleration signal stability time > 10.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					diagnsotic fault sequence gear active P0716 fault active P0716 test fail this key on P0717 fault active P0717 test fail this key on P07BF fault active P07BF test fail this key on P07C0 fault active P07C0test fail this key on attained gear ABS(raw longitudinal acceleration signal) AND ABS(raw longitudinal acceleration signal) update region 4 sample time: brake pedal position engine torque TOSS vehicle speed acceleration TOSS vehicle speed TOSS vehicle speed ABS(raw longitudinal acceleration signal) update sample time U0073 fault active U0073 test fail this key on DTCs not fault active	= FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1st thru 10th > 0.5300 g < 3.8500 g < 0.70 % < 50.0 Nm < -0.1700 g > 2.0 KPH < 120.0 KPH < 0.5300 g = FALSE = FALSE VehicleSpeedSensor_FA VehicleSpeedSensorError	region 4 fail time > 2.0 seconds out of region 4 sample time > 2.5 seconds, 50 millisecond update rate	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Longitudinal Acceleration Sensor Circuit Low	C0553	Controller specific analog circuit diagnoses the raw longitudinal acceleration signal for a short to ground or open fault by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral longitudinal acceleration signal = 0.0 g.	raw longitudinal acceleration signal when sensor type is directly proportional OR raw longitudinal acceleration signal when sensor type is inversely proportional update raw longitudinal acceleration signal stability time, fail and sample time, 50 millisecond update rate	< -3.8500 g > -3.8500 g (< 0.5 Q impedance between signal and controller ground)	battery voltage run crank voltage diagnostic monitor enable sensor type is either directly proportional or inversely proportional U0073 fault active U0073 test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = CeLATR_e_VoltageDirectProp = FALSE = FALSE	raw longitudinal acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Longitudinal Acceleration Sensor Circuit High	C0554	Controller specific analog circuit diagnoses the raw longitudinal acceleration signal for a short to power or open fault by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral longitudinal acceleration signal = 0.0 g.	raw longitudinal acceleration signal when sensor type is directly proportional OR raw longitudinal acceleration signal when sensor type is inversely proportional update raw longitudinal acceleration signal stability time, fail and sample time, 50 millisecond update rate	> 3.8500 g < 3.8500 g (< 0.5 Q impedance between signal and controller power)	battery voltage run crank voltage diagnostic monitor enable sensor type is either directly proportional or inversely proportional U0073 fault active U0073 test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = CeLATR_e_VoltageDirectProp = FALSE = FALSE	raw longitudinal acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lateral Acceleration Sensor Circuit Low	C0697	Controller specific analog circuit diagnoses the raw lateral acceleration signal for a short to ground or open fault by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral acceleration signal = 0.0 g.	raw lateral acceleration signal when sensor type is directly proportional OR raw lateral acceleration signal when sensor type is inversely proportional update raw lateral acceleration signal stability time, fail and sample time, 50 millisecond update rate	< -3.8500 g > -3.8500 g (< 0.5 Q impedance between signal and controller ground)	battery voltage run crank voltage diagnostic monitor enable sensor type is either directly proportional or inversely proportional U0073 fault active U0073 test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = CeLATR_e_VoltageDirectProp = FALSE = FALSE	raw lateral acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lateral Acceleration Sensor Circuit High	C0698	Controller specific analog circuit diagnoses the raw lateral acceleration signal for a short to power or open fault by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral acceleration signal = 0.0 g.	raw lateral acceleration signal when sensor type is directly proportional OR raw lateral acceleration signal when sensor type is inversely proportional update raw lateral acceleration signal stability time, fail and sample time, 50 millisecond update rate	> 3.8500 g < 3.8500 g (< 0.5 Q impedance between signal and controller power)	battery voltage run crank voltage diagnostic monitor enable sensor type is either directly proportional or inversely proportional U0073 fault active U0073 test fail this key on	> 11.00 volts > 11.00 volts = 1 Boolean = CeLATR_e_VoltageDirectProp = FALSE = FALSE	raw lateral acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lateral Acceleration Sensor Performance	C0699	Controller specific analog circuit diagnoses the raw lateral acceleration signal for a signal value that is stuck in a valid range by comparing raw signal value to fail thresholds. Emission neutral default state sets lateral acceleration signal = 0.0 g.	ABS(raw lateral acceleration signal) AND ABS(raw lateral acceleration signal) update raw lateral acceleration signal fail, 50 millisecond update rate	> 0.5300 g < 3.8500 g	battery voltage run crank voltage diagnostic monitor enable update raw lateral acceleration signal stablity time: TOSS vehicle speed automatic transmission is clutch to clutch OR dual clutch high side drive 1 enable high side drive 2 enable diagnsotic fault sequence gear active P0716 fault active P0716 test fail this key on P0717 fault active P0717 test fail this key on P07BF fault active P07BF test fail this key on P07C0 fault active P07C0test fail this key on attained gear ABS(raw lateral acceleration signal) update sample time U0073 fault active U0073 test fail this key on DTCs not fault active	> 11.00 volts > 11.00 volts = 1 Boolean > 15.0 KPH = TRUE = TRUE = TRUE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1st thru 10th < 0.5300 g = FALSE = FALSE VehicleSpeedSensor_FA	raw lateral acceleration signal stability time > 30.0 seconds, fail time > 75.0 seconds out of sample time> 120.0 seconds, 50 millisecond update rate	Type C, 1 Trip No MIL Emissions Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Actuator Supply Voltage Circuit Low	P0658	Controller specific output driver circuit diagnoses the high sided driver circuit for a short to ground failure, or where controller H/W cannot differentiate, diagnoses the high sided driver circuit for a short to ground failure or open circuit failure, when the output is powered on, by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground or an open circuit.	< 0.5 0 impedance between signal and controller ground OR > 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail count and increment sample count, otherwise increment only sample count	(ground short diagnostic monitor enable calibration OR open circuit diagnostic monitor enable calibration) high side drive ON service mode $04 active	= 1 Boolean = 1 Boolean = TRUE = FALSE	ground short fail count > 6 counts within sample count of 2,400 counts OR open circuit fail count > 30 counts within sample count of 50 counts 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Fluid Temperature (TFT) Sensor Performance	P0711	The diagnostic monitor will verify the time to transmission fluid temperature warm up based on the raw transmission fluid temperature sesnor, any intermittent signal that causes multiple unrealistic delta changes (intermittent faults) based on the raw transmission fluid temperature sesnor, and, raw transmission fluid temperature sesnor signal stuck in valid range.	raw transmission fluid temperature and the transmission fluid temperature warm up time has elapsed	< 15.0 °C			transmission fluid temperature warm up time > **transmission fluid temperature warm up time** seconds	Type B, 2 Trips
					diagnsotic monitor enable	= 1 Boolean		
					P0712 NOT fault active			
					P0713 NOT fault active			
					battery voltage	> 9.00 volts	battery voltage time > 0.100 seconds	
					run crank voltage	> 9.00 volts	run crank voltage time > 0.100 seconds	
					warm up test enable	= 1 Boolean		
					TFT rationality diagnostic monitor enabled	= VeTFSR_b_TFT_RatlEnbl		
					driver accelerator pdeal position	> 5.0 %		
					engine torque	> 50.0 Nm		
					engine speed	> 500.0 RPM		
					vehicle speed	> 10.0 KPH		
					engine coolant temperature	> -40.0 °C		
					engine coolant temperature	< 150.0 °C		
					raw transmission fluid temperature	> -273.0 °C		
					raw transmission fluid temperature	< 150.0 °C		
					P2818 fault active	= FALSE		
					P2818 test fail this key on	= FALSE		
					DTCs not fault active			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					TFT Warmup Pass P0711 test fail this key on	EngineTorqueEstlnaccurate AcceleratorPedalFailure CrankSensor_FA ECT_Sensor_FA VehicleSpeedSensor_FA = FALSE = FALSE		
			current transmission fluid temperature string length = previous transmission fluid temperature transmission temperature string length + (raw transmission fluid temperature - previous raw transmission fluid temperature, update rate 100 milliseconds, increment sample count	> 80.0 °C			sample count > 10 counts evaluate fail temperature threshold, 100 millisecond update rate, if transmission fluid temperature string length above fail threshold increment fail time fail time > 8.0 seconds out of sample time > 12.0 seconds	
					diagnsotic monitor enable P0712 NOT fault active P0713 NOT fault active	= 1 Boolean		
					battery voltage	> 9.00 volts	battery voltage time > 0.100 seconds	
					run crank voltage	> 9.00 volts	run crank voltage time > 0.100 seconds	
					intermittent test enable	= 1 Boolean		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					propulsion system active	= TRUE		
			raw transmission fluid temperature - previous raw transmission fluid temperature, update rate 100 milliseconds, update fail time	< 0.0000 °C	diagnsotic monitor enable P0712 NOT fault active P0713 NOT fault active battery voltage run crank voltage stuck in range test enable propulsion system active raw transmission fluid temperature raw transmission fluid temperature	= 1 Boolean > 9.00 volts > 9.00 volts = 1 Boolean = TRUE > -273.0 °C < 150.0 °C	fail time > 300.0 seconds battery voltage time > 0.100 seconds run crank voltage time > 0.100 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Fluid Temperature Sensor Circuit Low Voltage	P0712	Controller specific analog circuit diagnoses the transmission fluid temperature sensor and wiring for a short to ground fault by comparing a voltage measurement to controller specific voltage thresholds, converted to a resistance value.	circuit resistance update fail time 1 seconds update rate	< 13.500 Q	diagnostic monitor enable battery voltage run crank voltage run crank voltage in range time	= 1 Boolean > 9.00 volts > 9.00 volts	fail time > 5.00 seconds out of sample time > 6.00 seconds 1 seconds update rate battery voltage in range time > 0.100 seconds run crank voltage in range time > 0.100 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Fluid Temperature Sensor Circuit Low Voltage	P0713	Controller specific analog circuit diagnoses the transmission fluid temperature sensor and wiring for an open circuit or short to voltage failure by comparing a voltage measurement to controller specific voltage thresholds, converted to a resistance value.	circuit resistance update fail time 1 seconds update rate	>284,177.0 Q	diagnostic monitor enable battery voltage run crank voltage run crank voltage in range time	= 1 Boolean > 9.00 volts > 9.00 volts	fail time > 5.00 seconds out of fail time > 6.00 seconds 1 seconds update rate battery voltage in range time > 0.100 seconds run crank voltage in range time > 0.100 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Input Speed Sensor Performance	P0716	Detects unrealistic drop in raw transmission input speed signal RPM. Drop events are counted up to fail threshold. A drop event is defined by a sudden delta change in RPM from one value to a lower value. The raw transmission input speed must achieve a value high enough to record an unrealistic drop sample to sample. Once the drop threshold is met, fail time is accumualted indicating the raw transmission input speed has not recovered above a threshold, allowing the fail event count to increment. Multiple fail event counts must occur, but if the signal remains low, no further deltas occur, the "Input Speed Sensor Circuit Low Voltage" DTC will set before P0716, as P0716 is designed to set based on an intermittent raw transmission input speed signal RPM.	delta raw transmission input speed delta raw transmission input speed = raw transmission input speed - last valid raw transmission input speed, 25 millisecond update rate	> 2,000.0 RPM	service mode $04 active run crank voltage diagnostic monitor enable P0717 test fail this key on P07BF test fail this key on P07C0 test fail this key on high side driver 1 enable high side driver 2 enable service fast learn active run crank voltage last valid raw transmission input speed OR valid raw transmission input speed (before drop event) last valid raw transmission input speed updates every 25 milliseconds when stablity time complete as long as (delta raw transmission input speed AND raw transmission input speed) raw transmission output speed accelerator pedal position engine torque engine torque transmission hydraulic pressure available: engine speed	= FALSE > 9.00 volts = 1 Boolean = FALSE = FALSE = FALSE = TRUE = TRUE = FALSE > 5.00 volts > 160.0 RPM > 160.0 RPM < 320.0 RPM > 160.0 RPM > 254.0 RPM > 5.0 % < 8,191.9 Nm > 30.0 Nm > 500.0 RPM	fail time > 1.500 seconds updated fail event count, fail event count > 5 counts, 25 millisecond update rate raw transmission input speed time > 2.000 seconds stability time > 0.100 seconds engine speed time >	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					DTCs not fault active	AcceleratorPedalFailure EngineTorqueEstInaccurate	**engine speed time for transmission hydraulic pressure available**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Input Speed Sensor Circuit Low Voltage	P0717	Detects no activity in raw transmission input speed signal RPM due to open ciruit electrical failure mode or sensor internal faults, or, controller internal failure modes. The raw transmission input speed signal RPM is rationalized against vehicle conditions in which the the powertrain is producing torque available at the drive wheels, but raw transmission input speed signal RPM remains low. After a sudden drop in raw transmission input speed signal RPM, a race condition can occur between P0717 and "Input Speed Sensor Performance" depending on the true nature of the failure.	raw transmission input speed OR TISS/TOSS fault (single power supply to TISS and TOSS) = TRUE, update fail time 25 millisecond update rate	< 100.0 RPM < 475.0 RPM	service mode $04 active diagnostic monitor enable run crank voltage service fast learn active run crank voltage P0722 fault active P0723 fault active P077C fault active P077D fault active brake pedal position sesnor must be OBDII to use brake pedal conditional brake pedal position sesnor type brake pedal position P0716 test fail this key on P07BF test fail this key on P07C0 test fail this key on accelerator pedal position engine torque engine torque (transmission current attained gear transmission current attained gear raw transmission output speed OR transmission current attained gear transmission current attained gear raw transmission output speed) P0717 fault active P0717 test fail this key on	= FALSE = 1 Boolean > 5.00 volts = FALSE > 9.00 volts = FALSE = FALSE = FALSE = FALSE = CeBRKR_e_OBD < 70.0 % = FALSE = FALSE = FALSE > 5.0 % >30.0 Nm < 8,191.9 Nm < CeCGSR_e_CR_Sixth > CeCGSR_e_CR_First > 162.0 RPM < CeCGSR_e_CR_Tenth > CeCGSR_e_CR_Sixth > 263.0 RPM = FALSE = FALSE	fail time > 4.00 seconds run crank voltage time > 25 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					TISS/TOSS fault (single power supply to TISS and TOSS) = TRUE occurs when: (P0722 fail time high gear exceeds fail threshold OR P0722 fail time low gear exceeds fail threshold) TISS/TOSS has single power supply calibration TISS/TOSS single power supply test enabled transmission hydraulic pressure available: engine speed DTCs not fault active	= 0 Boolean = 1 Boolean > 500.0 RPM EngineTorqueEstInaccurate	engine speed time > **engine speed time for transmission hydraulic pressure available**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Output Speed Sensor Performance	P0721	The diagnostic monitor determines if the direction TOSS value is coherent based on the on period time of the directional sensor and TOSS raw. When the on period time indicates a transitional state, the direction must also be transitional as measured by very slow TOSS raw RPM. When the on period time indicates a non-transitional state, forward or reverse, the direction must also be transition, not forward and not reverse.	TOSS raw direction when TOSS transitional period = FALSE AND TOSS raw direction when TOSS transitional period = FALSE OR TOSS raw when TOSS transitional period = TRUE update fail and sample time 6.26 millisecond update rate	# FORWARD # REVERSE > 225.0 RPM	service mode $04 active diagnostic monitor enable TOSS count sample period P0721 fault active P0721 test fail this key on TOSS transitional period detected = FALSE when: on period on period when direction unknown OR on period on period when direction is reverse OR on period on period when direction is forward TOSS transitional period detected = TRUE when: on period on period when direction unknown senor type is directional senor type calibration	= FALSE = 1 Boolean # 0 counts = FALSE = FALSE > 0.4434 seconds < 0.2773 seconds < 0.2363 seconds > 0.1240 seconds < 0.0811 seconds > 0.0088 seconds < 0.4434 seconds > 0.2773 seconds = CeTOSR_e_Directional	fail time > 3.500 seconds out of sample time > 5.000 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Output Speed Sensor Circuit Low Voltage	P0722	Detects no activity in raw transmission output speed signal RPM due to open ciruit electrical failure mode or sensor internal faults, or, controller internal failure modes. The raw transmission output speed signal RPM is rationalized against vehicle conditions in which the the powertrain is producing torque, but raw transmission output speed signal RPM remains low. After a sudden drop in raw transmission output speed signal RPM, a race condition can occur between P0722 and "Output Speed Sensor Circuit Intermittent" depending on the true nature of the failure.	raw transmission output speed, update fail time 6.25 millisecond update rate when: attained gear attained gear AND attained gear use high gear fail time threshold ELSE use low gear fail time threshold	< 30.0 RPM > CeCGSR_e_CR_First CeCGSR_e_C R_Tenth > CeCGSR_e_CR_Thir d	service mode $04 active diagnostic monitor enable when neutral range occurs: (garage shift OR PRNDL OR PRNDL OR range inhibit state) {}{when not neutral range occurs: attained gear attained gear (attained gear engine torque hysteresis high engine torque hysteresis low accelerator pedal position hysteresis high accelerator pedal position hysteresis low) when not neutral range occurs: (attained gear engine torque hysteresis high engine torque hysteresis low accelerator pedal position hysteresis high accelerator pedal position hysteresis low)}	= FALSE = 1 Boolean # COMPLETE = PARK = NEUTRAL # no inhibit active > CeCGSR_e_CR_First < CeCGSR_e_CR_Tenth > CeCGSR_e_CR_Third > 50.0 Nm > 30.0 Nm > 5.0 % > 3.0 % < CeCGSR_e_CR_Third > 80.0 Nm > 50.0 Nm > 8.0 % > 5.0 %	fail time >5.00 seconds high gear OR fail time > 3.50 seconds low gear Engine Torque criteria met > 0.10 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR {}{Wheel Speed Rationality Enable AND Transfer Case Range Valid AND Vehicle Speed Fault AND Tease state AND Wheel Speed Sensor Present AND Output Speed calculate from wheel speed} TISS/TOSS has single power supply calibration AND TISS AND TISS) OR TISS/TOSS has single power supply calibration AND TISS AND TISS) P0716 test fail this key on P0717 test fail this key on P07BF test fail this key on P07C0 test fail this key on PTO check: PTO enable calibration is FALSE OR	= 0.00 Boolean =TRUE = FALSE != Neutral = TRUE >= 100.00 rpm = 0 Boolean < 8,191.9 RPM > 475.0 RPM = 0 Boolean < 8,191.9 RPM > 5,800.0 RPM = FALSE = FALSE = FALSE = FALSE # 1 Boolean = 1 Boolean	Wheel Speed Rationality met = 0 s counts down from 0.25 s	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(PTO enable calibration is TRUE AND PTO active) run crank voltage service fast learn active run crank voltage transmission fluid temperature P0723 test fail this key on P077C test fail this key on P077D test fail this key on P0722 fault active P0722 test fail this key on transmission hydraulic pressure available: engine speed DTCs not fault active	= TRUE > 5.00 volts = FALSE > 9.00 volts > -40.00 °C = FALSE = FALSE = FALSE = FALSE = FALSE > 500.0 RPM AcceleratorPedalFailure EngineTorqueEstInaccurate	run crank voltage time > 25 milliseconds engine speed time > **engine speed time for transmission hydraulic pressure available**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Output Speed Sensor Circuit Intermittent	P0723	Detects unrealistic drop in raw transmission output speed signal RPM. Drop events are counted up to fail threshold. A drop event is defined by a sudden delta change in RPM from one value to a lower value. The raw transmission output speed must achieve a value high enough to record an unrealistic drop sample to sample. Once the drop threshold is met, fail time is accumualted indicating the raw transmission output speed has not recovered above a threshold, allowing the fail event count to increment. Multiple fail event counts must occur, but if the signal remains low, no further deltas occur, the "Output Speed Sensor Circuit Low Voltage" DTC will set before P0723, as P0723 is designed to set based on an intermittent raw transmission output speed signal RPM.	delta raw transmission output speed = raw transmission output speed previous loop - raw transmission output speed, 25 millisecond update rate Failing criteria depends on below decision tree for failure threshold If 4WD low engaged and wheel speed usage is not enabled Else If Wheel speed usage enabled for failing TOS drop diagnostic Else (Not 4WD and not Wheel Speed usage) If 4WD low is engaged and Wheel speed usage enabled	> 900.0 RPM **P0723 Wheel Speed Calc** function of output speed > 900.0 RPM > Above threshold * 1.00	service mode $04 active diagnostic monitor enable transmission engaged state 4WD low state PTO check: PTO enable calibration is FALSE OR (PTO enable calibration is TRUE AND PTO active) run crank voltage service fast learn active run crank voltage P077C test fail this key on P077D test fail this key on when PRNDL is moved to	= FALSE = 1 Boolean # not engaged = 4WD low state previous loop, 25 millisecond update rate # 1 Boolean = 1 Boolean = TRUE > 5.00 volts = FALSE > 9.00 volts = FALSE = FALSE	fail time > 1.500 seconds updated fail event count, fail event count > 5 counts, 25 millisecond update rate transmission engaged state time > **P0723 (MY21) transmission engaged state time threshold** 4WD low change time > 3.0 seconds run crank voltage time > 25 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					NEUTRAL allow transmission engaged state time before enabling fail evaluation, or, if raw raw transmission output speed is active in NEUTRAL enable fail evaluation:			
					PRNDL	= CeTRGR_e_PRNDL_Neutral		
					OR			
					PRNDL	= CeTRGR_e_PRNDL_Transitionall		
					OR	N-D transitional		
					PRNDL	= CeTRGR_e_PRNDL_Transitional4		
					OR	R-N transitional		
					raw transmission output speed	> 250.0 RPM		
					OR			
					last valid raw transmission output speed	> 250.0 RPM		
					determine if raw transmission input speed is stable:			
					((raw transmission input speed - raw transmission input speed previous, 25 millisecond update	< 4,095.9 RPM		
					AND		raw transmission input speed stability time > 2.00 seconds	
					raw transmission input speed)	> 160.0 RPM		
					OR			
					Wheel speed usage enabled for failing TOS drop diagnostic)	= TRUE		
					OR			
					(TISS/TOSS has single oower suoolv calibration	= 0 Boolean	no time required	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					AND raw transmission input speed)	= 0.0 RPM		
					select delta RPM fail theshold: (4WD low state AND4WD low valid) select P0723 4WD TOSS delta fail threshold otherwise use P0723 TOSS delta fail threshold	 = TRUE = TRUE		
					last valid raw transmission output speed OR valid raw transmission output speed (before drop event)	> 89.0 RPM > 89.0 RPM	raw transmission output speed time > 2.00 seconds	
					Wheel speed usage enabled for failing TOS drop diagnostic AND TOS - Calculated TOS from Wheel Speed	= TRUE > 190.00 rpm		
					last valid raw transmission output speed updates every 25 milliseconds when stablity time complete as long as (delta delta raw transmission output speed AND raw transmission output speed)	< 140.0 RPM > 89.0 RPM	stability time > 0.100 seconds	
					transmission hydraulic pressure available: enqine speed	> 500.0 RPM	engine speed time >	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					DTCs not fault active	AcceleratorPedalFailure EngineTorqueEstInaccurate	**engine speed time for transmission hydraulic pressure available**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid A Stuck Off	P0746	Each pressure control solenoid stuck off diagnostic monitor detects a clutch pressure control solenoid failed hydraulically off, while the solenoid is electrically functional. In the failure mode the clutch slip speed, and gear box gear slip, will be excessive, not near or at zero RPM. The clutch slip speed is calculated based on the transmission lever node design, requiring transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. The clutch pressure control solenoid is tested after an automatic transmission shift occurs and has been considered shift complete, or, steady state gear is deemed active, range shift complete. When the automatic transmission shift is complete, steady state gear is considered, the clutch pressure control solenoid is mapped to transmission line	C1 clutch slip speed, update fail time 6.25 milliscond update	> 200.0 RPM	**********	**********	fail time > 1.00 seconds, update fail count, fail count > 3 counts 6.25 milliscond update	Type A, 1 Trips
					system-level enables:			
					use battery voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use battery voltage calibration is TRUE	= 1 Boolean		
					AND			
					battery voltage)	> 9.00 volts	battery voltage time > 0.100 seconds	
					use run crank voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use run crank voltage calibration is TRUE	= 1 Boolean		
					AND			
					run crank voltage)	> 9.00 volts	run crank voltage time > 0.100 seconds	
					TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		pressure control, which normally allows the clutch to maintain full torque holding capacity at the given engine crankshaft torque, to maintain true gear ratio. When the clutch pressure control solenoid is failed hydraulically off, the clutch does not maintain holding capacity at any engine crankshaft torque, and the clutch slip speed is uncontrollable. The clutch pressure control solenoid test is suspended if the higher level safety startle mitigation function is active. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed in the opposite sense, clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional, which must take priority over any clutch pressure control solenoid stuck off diagnostic monitor. All clutch pressure control			procedure active hydraulic pressure available (hydraulic pressure OR Clutch Stuck on in Park/ Neutral fault pending OR Neutral Staging Line Pressure Disable) ********** enable C1 clutch slip speed fail compare when: ((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) unintended deceleration fault pending OR unintended deceleration fault pending enable cal is FALSE (startle mitigation) clutch steady state adaptive active (transmission output shaft speed OR accelerator pedal position OR	= FALSE Boolean = TRUE > -999.00 kPa = TRUE = TRUE ********** = FALSE = TRUE # initial startle mitigation gear = FALSE = 0 (0 to enable, 1 to disable) = FALSE > 89.0 RPM > 2.00 %		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		solenoid stuck on/off diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck off test is disabled. This diagnostic monitor is relative to C1 (GF9 CB123456) clutch pressure control solenoid.			engine speed OR transmission input shaft speed) C1 clutch slip speed valid C1 clutch pressured map (enable forward gear cal AND driver direction request AND Attained Gear) OR (enable reverse gear cal AND driver direction request AND Attained Gear) range shift state ********** DTCs not fault pending DTCs not fault active	> 1,500.0 RPM > 450.0 RPM = TRUE (all speed sensors are functional for lever node clutch slip speed calculation) = mapped to line pressure, C1 clutch pressure has reached fully applied state = 1 (1 to enable, 0 to disable) = FORWARD = a FORWARD gear = 0 (1 to enable, 0 to disable) = REVERSE = REVERSE = range shift complete ********** P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6 P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C	> 1.000 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P178F P17C6 P17C4 P17C7 P172A P172B		
					NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715P2724 P2733 P2821			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid A Stuck On	P0747	Each pressure control solenoid stuck on diagnostic monitor detects a clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional. The clutch pressure control solenoid is tested during an automatic transmission shift by monitoring the off going clutch slip speed. With the clutch pressure control solenoid failed on, still allowing hydraulic pressure to the clutch being commanded off, the intended off going clutch continues to maintain torque capacity during the transmission automatic shift. In the failure mode, the off going clutch slip speed will remain near zero RPM when the clutch pressure control solenoid is commanded to an off pressure in the normal operation to release the holding clutch. The clutch slip speed is calculated based on the transmission lever node design, requiring	shift type is power down shift: C1 clutch slip speed OR shift type is garage shift: C1 clutch slip speed ELSE shift is another type: C1 clutch slip speed update fail time 6.25 milliscond update	 < 50.0 RPM < 100.00 RPM < 50.0 RPM			Base fail time: shift type is power down shift: fail time > 0.80 seconds shift type is garage shift: fail time > 0.25 shift type is another type: fail time > 0.150 seconds Add fail time offset according to shift type: open throttle upshift: **Clutch Stuck On Fail Offset Time PU Shifts** open throttle downshift: **Clutch Stuck On Fail Offset Time PD Shifts** garage shift: **Clutch Stuck On Fail Offset Time GS Shifts** closed throttle downshift:	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. As part of the pressure control solenoid stuck on diagnostic monitor, the safety startle mitigation function executes when in steady state gear, no automatic transmission shift in progress. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed hydraulically on, while the solenoid is electrically functional. All clutch pressure control solenoid stuck on diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck on test			**********	**********	**Clutch Stuck On Fail Offset Time CD Shifts** negative torque upshift: **Clutch Stuck On Fail Offset Time NU Shifts** clutch staging shift: **Clutch Stuck On Fail Offset Time STGR Shifts** update fail count, fail count > 3 counts 6.25 milliscond update	
					system-level enables: use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage) use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage)	= 1 Boolean = 1 Boolean > 9.00 volts = 1 Boolean = 1 Boolean > 9.00 volts	battery voltage time > 0.100 seconds run crank voltage time > 0.100	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		is disabled. This diagnostic monitor is relative to the GF9 C1 CB123456 clutch pressure control solenoid.			TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean	seconds	
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning procedure active	= FALSE Boolean		
					hydraulic pressure available	= TRUE		
					(hydraulic pressure	> -999 kPa		
					OR			
					Park/Neutral Stuck on FP	= TRUE		
					OR			
					Neutral Staging Line Pressure Disable)	= TRUE		
					**********	**********		
					range shift state	# range shift complete		
					diagnostic clutch test	= OFF GOING CLUTCH TEST		
					transmission output shaft speed	> 89.0 RPM		
					((C1 off going clutch pressure control ramp time out complete	= TRUE		
					AND			
					off going clutch pressure ramp control ramp time out enable)	= 1 (1 to enable, 0 to disable)	exhaust delay by	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR C1 off going clutch command pressure) (engine torque AND Primary oncomina stuck	 < 100.0 kPa > 8,191.8 Nm = 0 (0 is enable. 1 is	shift type: closed throttle upshift: **C1 exhaust delay closed throttle lift foot up shift** open throttle upshift: **C1 exhaust delay open throttle power on up shift** garage shifts: **C1 exhaust delay garage shift** closed throttle downshift: **C1 exhaust delay closed throttle down shift** negative torque upshift: **C1 exhaust delay negative torque up shift** open throttle downshift: **C1 exhaust delay open throttle power down shift**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					on torque enable cal) OR (primary oncoming clutch active primary on coming control state primary on coming commanded pressure)	enable) = TRUE # clutch fill phase > pressure clip threshold according to shift type: closed/open throttle upshifts dependent on oncoming clutch: **C2 Powered Upshift Tq Based Pres Clip** OR **C3 Powered Upshift Tq Based Pres Clip** OR **C4 Powered Upshift Tq Based Pres Clip** OR **C5 Powered Upshift Tq Based Pres Clip** OR **C6 Powered Upshift Tq Based Pres Clip** coasting downshift dependent on oncoming clutch: **C2 Coasting Downshift Ta Based Pres Clio**	Post-torque phase delay for powered upshifts is dependent on the oncoming clutch: **C2_Oncoming Post-Torque Phase Delay** OR **C3_Oncoming Post-Torque Phase Delay** OR **C4_Oncoming Post-Torque Phase Delay** OR **C5_Oncoming Post-Torque Phase Delay** OR **C6_Oncoming Post-Torque Phase Delay**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						OR **C3 Coasting Downshift Tq Based Pres Clip** OR **C4 Coasting Downshift Tq Based Pres Clip** OR **C5 Coasting Downshift Tq Based Pres Clip** OR **C6 Coasting Downshift Tq Based Pres Clip** clip thresholds for all other shift types: garage shifts: **Clutch Clip Press GS Shifts** negative torque upshift: **Clutch Clip Press NU Shifts** open throttle downshift: **Clutch Clip Press PD Shifts**		
					C1 clutch slip speed valid, all speed sensors are functional for lever node clucth slip speed calculation ********** conditions needed to trigger test: (current shift tvoe	= TRUE ********** # Garaae shift		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					AND shift type enable cal for current shift type) OR (Intrusive shift active AND shift type enable cal for garage shift AND Attained Gear AND (stuck on enable cal for forward garge shifts AND driver requested direction AND commanded gear) OR (stuck on enable cal for reverse garage shifts AND driver requested direction AND commanded gear)) clutch stuck off intrusive shift active startle mitigation active (see note on startle mitigation below) (new clutch controller has been initalized OR transitioning to a different clutch controller) current clutch solenoid test state	**Clutch Stuck On Shift = Type Enable** (0 table value will disable, 1 will enable) = FALSE = 0 (0 will enable, 1 will enable) = NEUTRAL OR commanded gear = 0 (0 to disable, 1 to enable) = FORWARD = a FORWARD gear = 0 (0 to disable, 1 to enable) = REVERSE = REVERSE = FALSE = FALSE = TRUE = TRUE transitions to TestState or TUT HOLD (see note		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						below about state transitions)		
					**********	**********		
					DTCs not fault pending	P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6		
					DTCs not fault active	P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P2820 P178F P17C6 P17C4 P17C7 P172AP172B		
					**********	**********		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					NOTE: Clutch control solenoid test state TIE UP TEST HOLD is necessary, as it is possible to have multiple off going clutches during one automatic transmission shift. Clutch control solenoid test state is set to TIE UP TEST HOLD during an automatic transmission shift due to two conditions: Current value of clutch control solenoid test state is TIE UP TEST TEST STATE, when one off going clutch pressure control solenoid stuck on diagnostic monitor is currently executing. AND That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed > clutch slip speed fail threshold. Once clutch control solenoid test state is set to TIE UP TEST HOLD, it remains TIE UP TEST HOLD during the automatic transmission shift, until: An additional off going clutch occurs, as indicated by solenoid stuck on test trigger = TRUE, subsequently			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					clutch control solenoid test state is reset to TIE UP TEST TEST STATE, to allow the additional corresponding off going clutch pressure control solenoid stuck on diagnostic monitor to execute. OR The automatic transmission shift completes, range shift state = range shift complete. NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control solenoid stuck on failure mode that occurs during steady state gear, not during an automatic transmission shift. The startle mitigation active then forces the transmission clutch pressure control system to a safe gear or neutral state, based on the active and inactive clutches, when the unintended vehicle deceleration occurred. Once a safe vehicle gear state is attained, the gear and clutch pressure control system allows transitions of the clutches on and off,			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					to sequence automatic transmission shifts, single step shifts. As each single step automatic transmission shift occurs the normal pressure control solenoid stuck on diagnostic monitors execute to verify which clutch pressure control solenoid is in the stuck on failure mode, allowing one of the clutch pressure control solenoid stuck on DTCstoset P0747, P0777, P0797, P2715, P2724, P2733, P2821.			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid B Stuck Off	P0776	Each pressure control solenoid stuck off diagnostic monitor detects a clutch pressure control solenoid failed hydraulically off, while the solenoid is electrically functional. In the failure mode the clutch slip speed, and gear box gear slip, will be excessive, not near or at zero RPM. The clutch slip speed is calculated based on the transmission lever node design, requiring transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. The clutch pressure control solenoid is tested after an automatic transmission shift occurs and has been considered shift complete, or, steady state gear is deemed active, range shift complete. When the automatic transmission shift is complete, steady state gear is considered, the clutch pressure control solenoid is mapped to transmission line	C2 clutch slip speed, update fail time 6.25 milliscond update	> 200.0 RPM	**********	**********	fail time > 1.00 seconds, update fail count, fail count > 2 counts 6.25 milliscond update	Type A, 1 Trips
					system-level enables:			
					use battery voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use battery voltage calibration is TRUE	= 1 Boolean		
					AND			
					battery voltage)	> 9.00 volts	battery voltage time > 0.100 seconds	
					use run crank voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use run crank voltage calibration is TRUE	= 1 Boolean		
					AND			
					run crank voltage)	> 9.00 volts	run crank voltage time > 0.100 seconds	
					TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		pressure control, which normally allows the clutch to maintain full torque holding capacity at the given engine crankshaft torque, to maintain true gear ratio. When the clutch pressure control solenoid is failed hydraulically off, the clutch does not maintain holding capacity at any engine crankshaft torque, and the clutch slip speed is uncontrollable. The clutch pressure control solenoid test is suspended if the higher level safety startle mitigation function is active. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed in the opposite sense, clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional, which must take priority over any clutch pressure control solenoid stuck off diagnostic monitor. All clutch pressure control			procedure active hydraulic pressure available (hydraulic pressure OR Clutch Stuck on in Park/ Neutral fault pending OR Neutral Staging Line Pressure Disable) ********** enable C2 clutch slip speed fail compare when: ((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) unintended deceleration fault pending OR unintended deceleration fault pending enable cal is FALSE (startle mitigation) clutch steady state adaptive active (transmission output shaft speed OR accelerator pedal position OR	= FALSE Boolean = TRUE > -999.00 kPa = TRUE = TRUE ********** = FALSE = TRUE # initial startle mitigation gear = FALSE = 0 (0 to enable, 1 to disable) = FALSE > 89.0 RPM > 2.00 %		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		solenoid stuck on/off diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck off test is disabled. This diagnostic monitor is relative to C2 (GF9 CB29) clutch pressure control solenoid.			engine speed OR transmission input shaft speed) C2 clutch slip speed valid C2 clutch pressured map (enable forward gear cal AND driver direction request AND Attained Gear) OR (enable reverse gear cal AND driver direction request AND Attained Gear) range shift state ********** DTCs not fault pending DTCs not fault active	> 1,500.0 RPM > 450.0 RPM = TRUE (all speed sensors are functional for lever node clutch slip speed calculation) = mapped to line pressure, C2 clutch pressure has reached fully applied state = 1 (1 to enable, 0 to disable) = FORWARD = a FORWARD gear = 0 (1 to enable, 0 to disable) = REVERSE = REVERSE = range shift complete ********** P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6 P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C	> 1.000 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P178F P17C6 P17C4 P17C7 P172A P172B		
					NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715P2724 P2733 P2821			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid B Stuck On	P0777	Each pressure control solenoid stuck on diagnostic monitor detects a clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional. The clutch pressure control solenoid is tested during an automatic transmission shift by monitoring the off going clutch slip speed. With the clutch pressure control solenoid failed on, still allowing hydraulic pressure to the clutch being commanded off, the intended off going clutch continues to maintain torque capacity during the transmission automatic shift. In the failure mode, the off going clutch slip speed will remain near zero RPM when the clutch pressure control solenoid is commanded to an off pressure in the normal operation to release the holding clutch. The clutch slip speed is calculated based on the transmission lever node design, requiring	shift type is power down shift: C2 clutch slip speed OR shift type is garage shift: C2 clutch slip speed ELSE shift is another type: C2 clutch slip speed update fail time 6.25 milliscond update	 < 50.00 RPM < 100.00 RPM < 50.00 RPM			Base fail time: shift type is power down shift: fail time > 0.80 seconds shift type is garage shift: fail time > 0.25 shift type is another type: fail time > 0.15 seconds Add fail time offset according to shift type: open throttle upshift: **Clutch Stuck On Fail Offset Time PU Shifts** open throttle downshift: **Clutch Stuck On Fail Offset Time PD Shifts** garage shift: **Clutch Stuck On Fail Offset Time GS Shifts** closed throttle downshift:	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. As part of the pressure control solenoid stuck on diagnostic monitor, the safety startle mitigation function executes when in steady state gear, no automatic transmission shift in progress. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed hydraulically on, while the solenoid is electrically functional. All clutch pressure control solenoid stuck on diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck on test			**********	**********	**Clutch Stuck On Fail Offset Time CD Shifts** negative torque upshift: **Clutch Stuck On Fail Offset Time NU Shifts** clutch staging shift: **Clutch Stuck On Fail Offset Time STGR Shifts** update fail count, fail count > 3 counts 6.25 milliscond update	
					system-level enables: use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage) use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage)	= 1 Boolean = 1 Boolean > 9.00 volts = 1 Boolean = 1 Boolean > 9.00 volts	battery voltage time > 0.100 seconds run crank voltage time > 0.100	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		is disabled. This diagnostic monitor is relative to the GF9 C2 CB29 clutch pressure control solenoid.			TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean	seconds	
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning procedure active	= FALSE Boolean		
					hydraulic pressure available	= TRUE		
					(hydraulic pressure	> -999 kPa		
					OR			
					Park/Neutral Stuck on FP	= TRUE		
					OR			
					Neutral Staging Line Pressure Disable)	= TRUE		
					**********	**********		
					range shift state	# range shift complete		
					diagnostic clutch test	= OFF GOING CLUTCH TEST		
					transmission output shaft speed	> 89.0 RPM		
					((C2 off going clutch pressure control ramp time out complete	= TRUE		
					AND			
					off going clutch pressure ramp control ramp time out enable)	= 1 (1 to enable, 0 to disable)	exhaust delay by	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR C2 off going clutch command pressure) (engine torque AND Primary oncoming stuck on toraue enable cal)	 < 171 kPa > 8,192 Nm = 0 (0 is enable, 1 is enable)	shift type: closed throttle upshift: **C2 exhaust delay open throttle power on up shift** open throttle upshift: **C2 exhaust delay open throttle power on up shift** garage shifts: **C2 exhaust delay garage shift** closed throttle downshift: **C2 exhaust delay closed throttle down shift** negative torque upshift: **C2 exhaust delay negative torque up shift** open throttle downshift: **C2 exhaust delay open throttle power down shift**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR (primary oncoming clutch active primary on coming control state primary on coming commanded pressure)	 = TRUE # clutch fill phase > pressure clip threshold according to shift type: closed/open throttle upshifts dependent on oncoming clutch: **C1 Powered Upshift Tq Based Pres Clip** OR **C3 Powered Upshift Tq Based Pres Clip** OR **C4 Powered Upshift Tq Based Pres Clip** OR **C5 Powered Upshift Tq Based Pres Clip** OR **C6 Powered Upshift Tq Based Pres Clip** coasting downshift dependent on oncoming clutch: **C1 Coasting Downshift Tq Based Pres Clip** OR	 Post-torque phase delay for powered upshifts is dependent on the oncoming clutch: **C1_Oncoming Post-Torque Phase Delay** OR **C3_Oncoming Post-Torque Phase Delay** OR **C4_Oncoming Post-Torque Phase Delay** OR **C5_Oncoming Post-Torque Phase Delay** OR **C6_Oncoming Post-Torque Phase Delay**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						C3 Coasting Downshift Tq Based Pres Clip OR **C4 Coasting Downshift Tq Based Pres Clip** OR **C5 Coasting Downshift Tq Based Pres Clip** OR **C6 Coasting Downshift Tq Based Pres Clip** clip thresholds for all other shift types: garage shifts: **Clutch Clip Press GS Shifts** negative torque upshift: **Clutch Clip Press NU Shifts** open throttle downshift: **Clutch Clip Press PD Shifts**		
					C2 clutch slip speed valid, all speed sensors are functional for lever node clucth slip speed calculation ********** conditions needed to trigger test: (current shift type AND	= TRUE ********** # Garage shift		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					shift type enable cal for current shift type) OR (Intrusive shift active AND shift type enable cal for garage shift AND Attained Gear AND (stuck on enable cal for forward garge shifts AND driver requested direction AND commanded gear) OR (stuck on enable cal for reverse garage shifts AND driver requested direction AND commanded gear)) clutch stuck off intrusive shift active startle mitigation active (see note on startle mitigation below) (new clutch controller has been initalized OR transitioning to a different clutch controller) current clutch solenoid test state	**Clutch Stuck On Shift = Type Enable** (0 table value will disable, 1 will enable) = FALSE = 0 (0 will enable, 1 will enable) = NEUTRAL OR commanded gear = 0 (0 to disable, 1 to enable) = FORWARD = a FORWARD gear = 0 (0 to disable, 1 to enable) = REVERSE = REVERSE = FALSE = FALSE = TRUE = TRUE transitions to TestState or TUT_HOLD (see note below about state		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						transitions)		
					**********	**********		
					DTCs not fault pending	P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6		
					DTCs not fault active	P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P2820 P178F P17C6 P17C4 P17C7 P172AP172B		
					**********	**********		
					NOTE: Clutch control			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					solenoid test state TIE UP TEST HOLD is necessary, as it is possible to have multiple off going clutches during one automatic transmission shift. Clutch control solenoid test state is set to TIE UP TEST HOLD during an automatic transmission shift due to two conditions: Current value of clutch control solenoid test state is TIE UP TEST TEST STATE, when one off going clutch pressure control solenoid stuck on diagnostic monitor is currently executing. AND That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed > clutch slip speed fail threshold. Once clutch control solenoid test state is set to TIE UP TEST HOLD, it remains TIE UP TEST HOLD during the automatic transmission shift, until: An additional off going clutch occurs, as indicated by solenoid stuck on test trigger = TRUE, subsequently clutch control solenoid			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					test state is reset to TIE UP TEST TEST STATE, to allow the additional corresponding off going clutch pressure control solenoid stuck on diagnostic monitor to execute. OR The automatic transmission shift completes, range shift state = range shift complete. NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control solenoid stuck on failure mode that occurs during steady state gear, not during an automatic transmission shift. The startle mitigation active then forces the transmission clutch pressure control system to a safe gear or neutral state, based on the active and inactive clutches, when the unintended vehicle deceleration occurred. Once a safe vehicle gear state is attained, the gear and clutch pressure control system allows transitions of the clutches on and off, to sequence automatic			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					transmission shifts, single step shifts. As each single step automatic transmission shift occurs the normal pressure control solenoid stuck on diagnostic monitors execute to verify which clutch pressure control solenoid is in the stuck on failure mode, allowing one of the clutch pressure control solenoid stuck on DTCstoset P0747, P0777, P0797, P2715, P2724, P2733, P2821.			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Output Speed Sensor Circuit Low	P077C	Controller specific analog circuit diagnoses the transmission output speed sensor and wiring for a short to ground fault by comparing a voltage measurement to controller specific voltage thresholds.	transmission output speed sesnor raw voltage, update fail time, 12.5 millisecond update rate	< 0.2500 volts (< 0.5 Q impedance between signal and controller ground)	service mode $04 active diagnostic monitor enable P077D fault active service fast learn run crank voltage battery voltage P077C fault active P077C test fail this key on	= FALSE = 1 Boolean = FALSE = FALSE > 10.00 volts > 10.00 volts = FALSE = FALSE	fail time > 0.050 seconds, update fail count, fail count > 16 counts 6.25 millisecond update rate run crank and battery voltage time > 5.000 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Output Speed Sensor Circuit High	P077D	Controller specific analog circuit diagnoses the transmission output speed sensor and wiring for a short to voltage fault by comparing a voltage measurement to controller specific voltage thresholds.	transmission output speed sesnor raw voltage, update fail time, 12.5 millisecond update rate	> 4.7500 volts (< 0.5 Q impedance between signal and controller power)	service mode $04 active diagnostic monitor enable P077C fault active service fast learn run crank voltage battery voltage P077D fault active P077D test fail this key on	= FALSE = 1 Boolean = FALSE = FALSE > 10.00 volts > 10.00 volts = FALSE = FALSE	fail time > 0.050 seconds, update fail count, fail count > 16 counts 6.25 millisecond update rate run crank and battery voltage time > 5.000 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid C Stuck Off	P0796	Each pressure control solenoid stuck off diagnostic monitor detects a clutch pressure control solenoid failed hydraulically off, while the solenoid is electrically functional. In the failure mode the clutch slip speed, and gear box gear slip, will be excessive, not near or at zero RPM. The clutch slip speed is calculated based on the transmission lever node design, requiring transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. The clutch pressure control solenoid is tested after an automatic transmission shift occurs and has been considered shift complete, or, steady state gear is deemed active, range shift complete. When the automatic transmission shift is complete, steady state gear is considered, the clutch pressure control solenoid is mapped to transmission line	C3 clutch slip speed, update fail time 6.25 milliscond update	> 200.0 RPM	**********	**********	fail time > 1.00 seconds, update fail count, fail count > 2 counts 6.25 milliscond update	Type A, 1 Trips
					system-level enables:			
					use battery voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use battery voltage calibration is TRUE	= 1 Boolean		
					AND			
					battery voltage)	> 9.00 volts	battery voltage time > 0.100 seconds	
					use run crank voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use run crank voltage calibration is TRUE	= 1 Boolean		
					AND			
					run crank voltage)	> 9.00 volts	run crank voltage time > 0.100 seconds	
					TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		pressure control, which normally allows the clutch to maintain full torque holding capacity at the given engine crankshaft torque, to maintain true gear ratio. When the clutch pressure control solenoid is failed hydraulically off, the clutch does not maintain holding capacity at any engine crankshaft torque, and the clutch slip speed is uncontrollable. The clutch pressure control solenoid test is suspended if the higher level safety startle mitigation function is active. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed in the opposite sense, clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional, which must take priority over any clutch pressure control solenoid stuck off diagnostic monitor. All clutch pressure control			procedure active hydraulic pressure available (hydraulic pressure OR Clutch Stuck on in Park/ Neutral fault pending OR Neutral Staging Line Pressure Disable) ********** enable C3 clutch slip speed fail compare when: ((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) unintended deceleration fault pending OR unintended deceleration fault pending enable cal is FALSE (startle mitigation) clutch steady state adaptive active (transmission output shaft speed OR accelerator pedal position OR	= FALSE Boolean = TRUE > -999.00 kPa = TRUE = TRUE ********** = FALSE = TRUE # initial startle mitigation gear = FALSE = 0 (0 to enable, 1 to disable) = FALSE > 89.0 RPM > 2.00 %		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		solenoid stuck on/off diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck off test is disabled. This diagnostic monitor is relative to C3 (GF9 CB38) clutch pressure control solenoid.			engine speed OR transmission input shaft speed) C3 clutch slip speed valid C3 clutch pressured map (enable forward gear cal AND driver direction request AND Attained Gear) OR (enable reverse gear cal AND driver direction request AND Attained Gear) range shift state ********** DTCs not fault pending DTCs not fault active	> 1,500.0 RPM > 450.0 RPM = TRUE (all speed sensors are functional for lever node clutch slip speed calculation) = mapped to line pressure, C3 clutch pressure has reached fully applied state = 1 (1 to enable, 0 to disable) = FORWARD = a FORWARD gear = 0 (1 to enable, 0 to disable) = REVERSE = REVERSE = range shift complete ********** P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6 P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C	> 1.000 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P178F P17C6 P17C4 P17C7 P172A P172B		
					NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715P2724 P2733 P2821			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid C Stuck On	P0797	Each pressure control solenoid stuck on diagnostic monitor detects a clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional. The clutch pressure control solenoid is tested during an automatic transmission shift by monitoring the off going clutch slip speed. With the clutch pressure control solenoid failed on, still allowing hydraulic pressure to the clutch being commanded off, the intended off going clutch continues to maintain torque capacity during the transmission automatic shift. In the failure mode, the off going clutch slip speed will remain near zero RPM when the clutch pressure control solenoid is commanded to an off pressure in the normal operation to release the holding clutch. The clutch slip speed is calculated based on the transmission lever node design, requiring	shift type is power down shift: C3 clutch slip speed OR shift type is garage shift: C3 clutch slip speed ELSE shift is another type: C3 clutch slip speed update fail time 6.25 milliscond update	 < 50.00 RPM < 100.00 RPM < 50.00 RPM			Base fail time: shift type is power down shift: fail time > 0.80 seconds shift type is garage shift: fail time > 0.25 shift type is another type: fail time > 0.15 seconds Add fail time offset according to shift type: open throttle upshift: **Clutch Stuck On Fail Offset Time PU Shifts** open throttle downshift: **Clutch Stuck On Fail Offset Time PD Shifts** garage shift: **Clutch Stuck On Fail Offset Time GS Shifts** closed throttle downshift:	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. As part of the pressure control solenoid stuck on diagnostic monitor, the safety startle mitigation function executes when in steady state gear, no automatic transmission shift in progress. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed hydraulically on, while the solenoid is electrically functional. All clutch pressure control solenoid stuck on diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck on test			**********	**********	**Clutch Stuck On Fail Offset Time CD Shifts** negative torque upshift: **Clutch Stuck On Fail Offset Time NU Shifts** clutch staging shift: **Clutch Stuck On Fail Offset Time STGR Shifts** update fail count, fail count > 3 counts 6.25 milliscond update	
					system-level enables: use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage) use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage)	= 1 Boolean = 1 Boolean > 9.00 volts = 1 Boolean = 1 Boolean > 9.00 volts	battery voltage time > 0.100 seconds run crank voltage time > 0.100	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		is disabled. This diagnostic monitor is relative to the GF9 C3 CB38 clutch pressure control solenoid.			TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean	seconds	
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning procedure active	= FALSE Boolean		
					hydraulic pressure available	= TRUE		
					(hydraulic pressure	> -999 kPa		
					OR			
					Park/Neutral Stuck on FP	=TRUE		
					OR			
					Neutral Staging Line Pressure Disable)	=TRUE		
					**********	**********		
					range shift state	# range shift complete		
					diagnostic clutch test	= OFF GOING CLUTCH TEST		
					transmission output shaft speed	> 89.0 RPM		
					((C3 off going clutch pressure control ramp time out complete	= TRUE		
					AND			
					off going clutch pressure ramp control ramp time out enable)	= 1 (1 to enable. 0 to	exhaust delay by	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR C3 off going clutch command pressure)	disable) < 115 kPa	shift type: closed throttle upshift: **C3 exhaust delay closed throttle lift foot up shift** open throttle upshift: **C3 exhaust delay open throttle power on up shift** garage shifts: **C3 exhaust delay garage shift** closed throttle downshift: **C3 exhaust delay closed throttle down shift** negative torque upshift: **C3 exhaust delay negative torque up shift** open throttle downshift: **C3 exhaust delay open throttle power down shift**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(engine torque AND Primary oncoming stuck on torque enable cal) OR (primary oncoming clutch active primary on coming control state primary on coming commanded pressure)	> 8,192 Nm = 0 (0 is enable, 1 is enable) = TRUE # clutch fill phase > pressure clip threshold according to shift type: closed/open throttle upshifts dependent on oncoming clutch: **C1 Powered Upshift Tq Based Pres Clip** OR **C2 Powered Upshift Tq Based Pres Clip** OR **C4 Powered Upshift Tq Based Pres Clip** OR **C5 Powered Upshift Tq Based Pres Clip** OR **C6 Powered Upshift Tq Based Pres Clip**	Post-torque phase delay for powered upshifts is dependent on the oncoming clutch: **C1_Oncoming Post-Torque Phase Delay** OR **C2_Oncoming Post-Torque Phase Delay** OR **C4_Oncoming Post-Torque Phase Delay** OR **C5_Oncoming Post-Torque Phase Delay** OR **C6_Oncoming Post-Torque Phase Delay**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						coasting downshift dependent on oncoming clutch: **C1 Coasting Downshift Tq Based Pres Clip** OR **C2 Coasting Downshift Tq Based Pres Clip** OR **C4 Coasting Downshift Tq Based Pres Clip** OR **C5 Coasting Downshift Tq Based Pres Clip** OR **C6 Coasting Downshift Tq Based Pres Clip** clip thresholds for all other shift types: garage shifts: **Clutch Clip Press GS Shifts** negative torque upshift: **Clutch Clip Press NU Shifts** open throttle downshift: **Clutch Clip Press PD Shifts**		
					C3 clutch slip speed valid, all speed sensors are functional for lever node clucth slip speed calculation	= TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					**********	**********		
					conditions needed to trigger test:			
					(current shift type	# Garage shift		
					AND			
					shift type enable cal for current shift type)	**Clutch Stuck On Shift = Type Enable** (0 table value will disable, 1 will enable)		
					OR			
					(Intrusive shift active	= FALSE		
					AND			
					shift type enable cal for garage shift	= 0 (0 will enable, 1 will enable)		
					AND			
					Attained Gear	= NEUTRAL OR commanded gear		
					AND			
					(stuck on enable cal for forward garge shifts	= 0 (0 to disable, 1 to enable)		
					AND			
					driver requested direction	= FORWARD		
					AND			
					commanded gear)	= a FORWARD gear		
					OR			
					(stuck on enable cal for reverse garage shifts	= 0 (0 to disable, 1 to enable)		
					AND			
					driver requested direction	= REVERSE		
					AND			
					commanded gear))	= REVERSE		
					clutch stuck off intrusive shift active	= FALSE		
					startle mitigation active (see note on startle mitigation below)	= FALSE		
					(new clutch controller has been initalized	= TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR transitioning to a different clutch controller)	= TRUE		
					current clutch solenoid test state	transitions to TestState or TUT_HOLD (see note below about state transitions)		
					**********	**********		
					DTCs not fault pending	P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6		
					DTCs not fault active	P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P2820 P178F		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					**********	P17C6 P17C4 P17C7 P172AP172B **********		
					NOTE: Clutch control solenoid test state TIE UP TEST HOLD is necessary, as it is possible to have multiple off going clutches during one automatic transmission shift. Clutch control solenoid test state is set to TIE UP TEST HOLD during an automatic transmission shift due to two conditions: Current value of clutch control solenoid test state is TIE UP TEST TEST STATE, when one off going clutch pressure control solenoid stuck on diagnostic monitor is currently executing. AND That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed > clutch slip speed fail threshold. Once clutch control solenoid test state is set to TIE UP TEST HOLD, it remains TIE UP TEST HOLD during the automatic transmission			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					shift, until: An additional off going clutch occurs, as indicated by solenoid stuck on test trigger = TRUE, subsequently clutch control solenoid test state is reset to TIE UP TEST TEST STATE, to allow the additional corresponding off going clutch pressure control solenoid stuck on diagnostic monitor to execute. OR The automatic transmission shift completes, range shift state = range shift complete. NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control solenoid stuck on failure mode that occurs during steady state gear, not during an automatic transmission shift. The startle mitigation active then forces the transmission clutch pressure control system to a safe gear or neutral state, based on the active and inactive clutches, when the unintended vehicle deceleration			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					occurred. Once a safe vehicle gear state is attained, the gear and clutch pressure control system allows transitions of the clutches on and off, to sequence automatic transmission shifts, single step shifts. As each single step automatic transmission shift occurs the normal pressure control solenoid stuck on diagnostic monitors execute to verify which clutch pressure control solenoid is in the stuck on failure mode, allowing one of the clutch pressure control solenoid stuck on DTCstoset P0747, P0777, P0797, P2715, P2724, P2733, P2821.			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Input/Turbine Speed SensorA Circuit Low	P07BF	Controller specific analog circuit diagnoses the transmission input/ turbine speed sensor and wiring for a short to ground fault by comparing a voltage measurement to controller specific voltage thresholds.	transmission intput/turbine speed sesnor raw voltage, update fail time, 12.5 millisecond update rate	< 0.2500 volts (< 0.5 Q impedance between signal and controller ground)	service mode $04 active diagnostic monitor enable P07C0 fault active service fast learn run crank voltage battery voltage P07BF fault active P07BF test fail this key on	= FALSE = 1 Boolean = FALSE = FALSE > 10.00 volts > 10.00 volts = FALSE = FALSE	fail time > 0.050 seconds, update fail count, fail count > 16 counts 6.25 millisecond update rate run crank and battery voltage time > 5.000 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Input/Turbine Speed SensorA Circuit High	P07C0	Controller specific analog circuit diagnoses the transmission input/ turbine speed sensor and wiring for a short to voltage fault by comparing a voltage measurement to controller specific voltage thresholds.	transmission input/turbine speed sesnor raw voltage, update fail time, 12.5 millisecond update rate	> 4.7500 volts (< 0.5 Q impedance between signal and controller power)	service mode $04 active diagnostic monitor enable P07BF fault active service fast learn run crank voltage battery voltage P07C0 fault active P07C0 test fail this key on	= FALSE = 1 Boolean = FALSE = FALSE > 10.00 volts > 10.00 volts = FALSE = FALSE	fail time > 0.050 seconds, update fail count, fail count > 16 counts 6.25 millisecond update rate run crank and battery voltage time > 5.000 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Upshift Switch Circuit	P0815	Diagnoses the state of the upshift switch circuit, stuck in the state "tap up" (upshift) active. Emissions neutral default, disables tap-up tap-down or manual-up manual-down.	switch state update fail time 1 100 millisecond update rate	= tap up (upshift) state active	service mode $04 active diagnostic monitor enable run crank voltage run crank voltage time run crank voltage P1761 fault active P0826 fault active P0826 test fail this key on P0826 fault pending (P0815 fault active OR P0815 fault active test fail this key on) PRNDL range change time PRNDL in range: D1 OR D2OR D3OR D4OR D5OR D6OR D7OR D8OR D9OR D10OR NEUTRAL OR PARK OR REVERSE DTCs not fault pending	= FALSE = 1 Boolean > 5.00 volts > 25 milliseconds > 9.00 volts = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE > 1.00 seconds = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = 0 Boolean = 0 Boolean Transmission Shift Lever Position Validity	fail time 1 > 1.00 seconds	Type C, 1 Trip No MIL Emissions Neutral
			switch state update fail time 2 100 millisecond update rate	= tap up (upshift) state active	service mode $04 active diagnostic monitor enable run crank voltage run crank voltage time run crank voltage P1761 fault active	= FALSE = 1 Boolean > 5.00 volts > 25 milliseconds > 9.00 volts = FALSE	fail time 2 > 120.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					P0826 fault active P0826 test fail this key on P0826 fault pending (P0815 fault active OR P0815 fault active test fail this key on) PRNDL range change time PRNDL in range: D1 OR D2OR D3OR D4OR D5OR D6OR D7OR D8OR D9OR D10OR NEUTRAL OR PARK OR REVERSE DTCs not fault pending	= FALSE = FALSE = FALSE = FALSE = FALSE > 1.00 seconds = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = 0 Boolean = 0 Boolean Transmission Shift Lever Position Validity		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Downshift Switch Circuit	P0816	Diagnoses the state of the downshift switch circuit, stuck in the state "tap down" (downshift) active. Emissions neutral default, disables tap-up tap-down or manual-up manual-down.	switch state update fail time 1 100 millisecond update rate	= tap down (downshift) state active	service mode $04 active diagnostic monitor enable run crank voltage run crank voltage time run crank voltage P1761 fault active P0826 fault active P0826 test fail this key on P0826 fault pending (P0816 fault active OR P0816 fault active test fail this key on) PRNDL range change time PRNDL in range: D1 OR D2OR D3OR D4OR D5OR D6OR D7OR D8OR D9OR D10OR NEUTRAL OR PARK OR REVERSE DTCs not fault pending	= FALSE = 1 Boolean > 5.00 volts > 25 milliseconds > 9.00 volts = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE > 1.00 seconds = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = 0 Boolean = 0 Boolean Transmission Shift Lever Position Validity	fail time 1 > 1.00 seconds	Type C, 1 Trip No MIL Emissions Neutral
			switch state update fail time 2 100 millisecond update rate	= tap down (downshift) state active	service mode $04 active diagnostic monitor enable run crank voltage run crank voltage time run crank voltage P1761 fault active	= FALSE = 1 Boolean > 5.00 volts > 25 milliseconds > 9.00 volts = FALSE	fail time 2 > 120.00 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					P0826 fault active P0826 test fail this key on P0826 fault pending (P0816 fault active OR P0816 fault active test fail this key on) PRNDL range change time PRNDL in range: D1 OR D2OR D3OR D4OR D5OR D6OR D7OR D8OR D9OR D10OR NEUTRAL OR PARK OR REVERSE DTCs not fault pending	= FALSE = FALSE = FALSE = FALSE = FALSE > 1.00 seconds = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = 0 Boolean = 0 Boolean Transmission Shift Lever Position Validity		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Up and Down Shift Switch Circuit	P0826	Diagnoses the state of the upshift/downshift switch circuit at an illegal voltage, voltage out of range. Emissions neutral default, disables tap-up tap-down or manual-up manual-down.	switch state update fail time 100 millisecond update rate	= illegal (voltage out of range)	service mode $04 active diagnostic monitor enable run crank voltage run crank voltage P1761 fault active (P0826 fault active OR P0826 fault active test fail this key on)	= FALSE = 1 Boolean > 5.00 volts > 9.00 volts = FALSE = FALSE = FALSE	fail time > 60.00 seconds run crank voltage time > 25 milliseconds	Type C, 1 Trip No MIL Emissio ns Neutral

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid A Control Circuit Open	P0960	Controller specific circuit diagnoses 9 speed CB123456, 10 speed CB123456R, 8 speed CB1278R clutch, or CVT secondary pulley solenoid for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit Increment fail time	> 200 K 0 impedance between signal and controller ground			fail time > 0.30 seconds out of sample time > 0.50 seconds	Type A, 1 Trips
					battery voltage	> 9.00 volts and < 32.00 volts	>1.00 seconds	
					(run crank voltage OR accessory voltage active OR Power Mode)	> 5.00 volts = TRUE = ACCESSORY	> 25 milliseconds	
					diagnostic monitor enable calibration	= 1 (1 is enable, 0 is disable)	> 12.5 milliseconds	
					(solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1)	= CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON		
					OR			
					(solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2)	= CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON		
					OR			
					(solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	= CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid A Control Circuit Low	P0962	Controller specific circuit diagnoses 9 speed CB123456, 10 speed CB123456R, 8 speed CB1278R clutch, or CVT secondary pulley solenoid for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode)) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid A Control Circuit High	P0963	Controller specific circuit diagnoses 9 speed CB123456, 10 speed CB123456R, 8 speed CB1278R clutch, or CVT secondary pulley solenoid for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage	< 0.5 0 impedance between signal and controller voltage source When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid B Control Circuit Open	P0964	Controller specific circuit diagnoses 9 speed CB29, 10 speed CB12891OR,8 speed CB12345R clutch, or CVT primary pulley solenoid for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit	> 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid B Control Circuit Low	P0966	Controller specific circuit diagnoses 9 speed CB29, 10 speed CB12891OR,8 speed CB12345R clutch, or CVT primary pulley solenoid for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid B Control Circuit High	P0967	Controller specific circuit diagnoses 9 speed CB29, 10 speed CB12891OR,8 speed CB12345R clutch, or CVT primary pulley solenoid for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage	< 0.5 0 impedance between signal and controller voltage source When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid C Control Circuit Open	P0968	Controller specific circuit diagnoses 9 speed CB38, 10 speed C23457910, 8 speed C13567 clutch, or CVT line pressure solenoid for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit	> 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid C Control Circuit Low	P0970	Controller specific circuit diagnoses 9 speed CB38,10 speed C23457910, 8 speed C13567 clutch, or CVT line pressure solenoid for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid C Control Circuit High	P0971	Controller specific circuit diagnoses 9 speed CB38, 10 speed C23457910, 8 speed C13567 clutch, or CVT line pressure solenoid for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage	< 0.5 0 impedance between signal and controller voltage source When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Surge Solenoid Circuit Open	P171A	Controller specific transmission surge accumulator control circuit diagnoses the transmission surge accumulator and wiring for an open circuit fault by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit Increment fail time	> 200 K Q impedance between signal and controller ground	battery voltage AND battery voltage battery enable time run/crank voltage run crank voltage time diagnostic monitor enable	> 9.00 volts < 32.00 volts > 1.000 seconds > 5.00 volts > 25 milliseconds = 1 Boolean	fail time > 0.300 seconds out of sample time > 0.500 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Surge Solenoid Circuit Low	P171B	Controller specific transmission surge accumulator control circuit diagnoses the transmission surge accumulator and wiring for a ground short circuit fault by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short Increment fail time	< 0.5 Q impedance between signal and controller ground	battery voltage battery voltage battery enable time run/crank voltage run crank voltage time > diagnostic monitor enable	> 9.00 volts < 32.00 volts > 1.00 seconds > 5.00 volts 25 milliseconds = 1 Boolean	fail time > 0.300 seconds out of sample time > 0.500 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Surge Solenoid Circuit High	P171C	Controller specific transmission surge accumulator control circuit diagnoses the transmission surge accumulator and wiring for a short to voltage circuit fault by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage Increment fail time	< 0.5 Q impedance between signal and controller voltage source	battery voltage battery voltage battery enable time run/crank voltage run crank voltage time diagnostic monitor enable	> 9.00 volts < 32.00 volts > 1.00 seconds > 5.00 volts time > 25 milliseconds = 1 Boolean	fail time > 0.100 seconds out of > 0.166 seconds sample time	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Surge Accumulator System Performance	P171D	Detects when the surge accumulator system, used to provide transmission hydraulic pressure, is not capable of supplying adequate hydraulic pressure during an engine auto-start. The transmission holding clutch pressures are commanded to meet the engine crank shaft torque output, to prevent clutch slip to those holding clutches, during the engine auto-start. The diagnostic monitors transmission input shaft speed during the auto-start event as the primary malfunction criteria. Measured input shaft speed that is excessive is an indication the holding clutches are slipping due to inadequate hydraulic pressure, as a result of a failed surge accumulator system.	Transmission turbine speed is greater than predicted turbine speed during autostart event, update initial fail count	**P171D predicted > turbine speed error** Refer to "Transmission Supporting Tables" for details	PRNDL state defaulted Transmission shift lever position Propulsion system active Ignition voltage Ignition voltage Transmission fluid temp Transmission fluid temp Hybrid state AutoStop duration min During autostop Engine speed was ********** If above conditions are met then the following must occur: Turbine speed Engine speed Hydraulic pressure delay time If above conditions are met then increment time-out timer. Time-out timer Note: The initial fail	= False = Forward range A = True > 9.00 volts < 31.99 volts > 0.00 °C < 110.00 °C = Engine off > 1.200 seconds < 5.0 RPM > 80.0 RPM > 450.0 RPM **P171D hydraulic > pressure delay** Refer to "Transmission Supporting Tables" for details < 0.38 seconds	> 8 counts (initial fail count) Frequency =12.5ms Once the above counts are achieved then increment the final fail counter once. The final fail counter can only increment once per autostart event > 3 counts (final fail counter) If above counter is greater than threshold then report DTC failed. Frequency = 12.5ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					counter must achieve it's fail threshold in less than the time-out time. ********** If vehicle is launched then:			
					Transmission gear ratio	= 4.689 1st gear ratio = 3.306 2nd gear ratio = 3.012 3rd gear ratio = 1.923 4th gear ratio = 1.446 5th gear ratio = 1.000 6th gear ratio		
					Trans 1st gear ratio	< 1.120 % of 1st gear ratio		
					Trans 1st gear ratio	> 0.880 % of 1st gear ratio		
					Trans gear ratio not 1st gear	< 1.070 % of gear ratio		
					Trans gear ratio not 1st gear	> 0.930 % of gear ratio		
					Valid transmission gear ratio achieved time	> 0.500 seconds		
					OR If vehicle is not launched but autostart occurs then:			
					Turbine speed	< 5.00 RPM		
					Turbine speed less then above threshold for	> 0.500 seconds		
					Note: During an autostart event the lack of hydraulic pressure will result in momentary clutch siio in			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					the C1234 clutch. After the clutch slip event, the main transmission pump and clutch will gain capacity, clutch slip will go to zero. If the vehicle is launching (moving) then a valid transmission ratio can be achieved. Or if the brake is continually applied and an autostart occurs naturally, then no ratio can be measured. In this case turbine speed will return to near zero rpm. ********** DTCs not fault active	CrankSensor_FA Transmission Output Shaft Angular Velocity Validity Transmission Turbine Angular Velocity Validity Transmission Oil Temperature Validity P171A P171B P171C U0101 P182E P1915		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Output Speed Sensor Circuit Forward Direction Error	P172A	The TOS sensor is a directional sensor, and raw TOS direction is rationalized based on attained gear and multiple speed sensors. Attained gear is a true indication of gear based on measured gear ratio, TISS/TOSS. If the raw TOS direction is not a forward gear but attained gear is a forward gear, and, TISS and intermediate speed sensors confirm consistent direction, the raw TOS direction is in error.	(raw TOS direction OR raw TIS direction OR intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw) AND attained gear AND attained gear	# forward # forward **intermediate speed sensor 1 or 2** **# predicted direction** **intermediate speed sensor 1 or 2** **# predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time (attained gear AND attained gear) P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality =enable calibration** = CeTOSR_e_Directional > 500.0 RPM >**engine speed time for transmission hydraulic pressure available** > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds > 1st gear < 10th gear = FALSE = range shift complete > 1.00 seconds	2.50 seconds	Type A, 1 Trips
			(raw TOS direction OR intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw) AND attained gear AND attained gear	# forward **intermediate speed sensor 1 or 2** **# predicted direction** **intermediate speed sensor 1 or 2** **# predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >**engine speed time for transmission hydraulic pressure available**	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					battery voltage for time service fast learn active run/crank voltage for time (attained gear AND attained gear) P0721 Fault Active range shift state (auto trans shift complete) enable time	> 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds > 1st gear < 10th gear = FALSE = range shift complete > 1.00 seconds		
			(raw TOS direction OR raw TIS direction OR intermediate speed sensor 2 direction raw) AND attained gear AND attained gear	# forward # forward **intermediate speed sensor 1 or 2** **# predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time (attained gear AND attained gear) P0721 Fault Active range shift state (auto trans shift complete)	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds > 1st gear < 10th gear = FALSE = range shift complete	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					enable time	> 1.00 seconds		
			(raw TOS direction OR raw TIS direction OR intermediate speed sensor 1 direction raw) AND attained gear AND attained gear	# forward # forward **intermediate speed sensor 1 or 2** **# predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time (attained gear AND attained gear) P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds > 1st gear < 10th gear = FALSE = range shift complete > 1.00 seconds	2.50 seconds	
			(raw TOS direction OR intermediate speed sensor 2 direction raw) AND attained gear AND attained gear	# forward **intermediate speed sensor 1 or 2** **# predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						engine speed time for transmission hydraulic pressure available		
					battery voltage for time service fast learn active run/crank voltage for time (attained gear AND attained gear) P0721 Fault Active range shift state (auto trans shift complete) enable time	> 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds > 1st gear < 10th gear = FALSE = range shift complete > 1.00 seconds		
			(raw TOS direction OR intermediate speed sensor 1 direction raw) AND attained gear AND attained gear	# forward **intermediate speed sensor 1 or 2** **# predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time (attained gear AND attained gear) P0721 Fault Active	**speed sensor directional rationality** **= enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds > 1st gear < 10th gear = FALSE	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					range shift state (auto trans shift complete) enable time	= range shift complete > 1.00 seconds		
			(raw TOS direction OR raw TIS direction) AND attained gear AND attained gear	# forward # forward > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time (attained gear AND attained gear) P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds > 1st gear < 10th gear = FALSE = range shift complete > 1.00 seconds	2.50 seconds	
			raw TOS direction attained gear	# forward > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time (attained gear AND attained gear) P0721 Fault Active range shift state (auto trans shift complete) enable time	> 500.0 RPM >**engine speed time for transmission hydraulic pressure available** > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds > 1st gear < 10th gear = FALSE = range shift complete > 1.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Control System - Shift Limiting Active	P175E	The latent fault diagnostic monitors detects when the vehicle has been driven excessively with an emission MIL request. The DTCs requesting the emission MIL are all due to a safety critical system or component fault present in which a DTC is set fault active, test fail this key on or fault pending (fault pending is fail time # 0). The safety critical systems or safety critical components include: transmission input, output and intermediate speed sensors, transmission range sensors, clutch pressure control solenoids including unintended deceleration detected due to clutch pressure control solenoids, driver accelerator pedal position, engine crankshaft position and engine torque. The DTCs for these safety critical systems or safety critical components include both electrical fault DTCs and performance fault DTCs. The latent fault diagnostic monitor	unintended decel test system fault unintended decel test system fault occur RunCrankVoltageMet (*default gear option active OR (*default gear option active AND unintended deceleration latent fault fail count)) UPDATE unintended decel test system fault time *default gear option active occurs when emission MIL active due to transmission default gear	= FALSE = TRUE = TRUE = FALSE = TRUE = 100 counts	test enable calibration RunCrankVoltageMet = TRUE when: run crank voltage for run crank voltage time vehicle speed trip criteria met when: vehicle speed trip criteria met RunCrankVoltageMet vehicle speed for vehicle speed time THEN SET vehicle speed trip criteria met = TRUE continue execute only IF: calibrated for a back up signal to longitudinal acceleration and total brake axle torque using and wheel speed or TOSS OR U0121 (loss comm ABS/EBCM) occurs OR brake pedal position fault THEN SET unintended decel test system fault occur = TRUE	= 1 Boolean > 5.00 volts > 12.5 milliseconds = FALSE = TRUE > 18.0 KPH > 120.0 seconds = CeTSDD_e_WhlSpdBackUp	unintended decel test system fault time > 10.0 seconds UPDATE unintended deceleration latent fault fail count SET unintended decel test system fault = TRUE unintended deceleration latent fault fail count > 100 counts 25 millisecond update rate	Type A, 1 Trips
			ECM range sensor fault ECM range sensor fault occur RunCrankVoltageMet (*default gear option active OR (*default gear option active	= FALSE = TRUE = TRUE = FALSE = TRUE	test enable calibration RunCrankVoltageMet = TRUE when: run crank voltage for run crank voltage time vehicle speed trip criteria met when: vehicle speed trip criteria	= 0 Boolean > 5.00 volts > 12.5 milliseconds = FALSE	ECM range sensor fault time > 10.0 seconds UPDATE ECM range sensor latent fault fail count SET ECM range sensor fault = TRUE	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		counts the run/crank ignition cycles before the latent fault DTC is set fault active.	AND ECM range sensor latent fault fail count)) UPDATE ECM range sensor fault time *default gear option active occurs when emission MIL active due to transmission default gear	= 200 counts	met RunCrankVoltageMet vehicle speed for vehicle speed time THEN SET vehicle speed trip criteria met = TRUE IF ECM P2802 fault active OR ECM P2803 fault active SET ECM range sensor fault occur = TRUE	= TRUE > 18.0 KPH > 120.0 seconds = TRUE = TRUE	ECM range sensor latent fault fail count > 200 counts 25 millisecond update rate	
			TCM range sensor fault TCM range sensor fault occur RunCrankVoltageMet (*default gear option active OR (*default gear option active AND TCM range sensor latent fault fail count)) UPDATE TCM range sensor fault time *default gear option active occurs when emission MIL active due to transmission default gear	= FALSE = TRUE = TRUE = FALSE = TRUE = 200 counts	test enable calibration RunCrankVoltageMet = TRUE when: run crank voltage for run crank voltage time vehicle speed trip criteria met when: vehicle speed trip criteria met RunCrankVoltageMet vehicle speed for vehicle speed time THEN SET vehicle speed trip criteria met = TRUE IF TCM P0707 fault active OR TCM P0708 fault active SET TCM range sensor fault occur = TRUE	= 0 Boolean > 5.00 volts > 12.5 milliseconds = FALSE = TRUE > 18.0 KPH > 120.0 seconds = TRUE = TRUE	TCM range sensor fault time > 10.0 seconds UPDATE TCM range sensor latent fault fail count SET TCM range sensor fault = TRUE TCM range sensor latent fault fail count > 200 counts 25 millisecond update rate	
			TOSS fault TOSS fault occur RunCrankVoltageMet (default gear option	= FALSE = TRUE = TRUE = FALSE	test enable calibration RunCrankVoltageMet = TRUE when: run crank voltage	= 1 Boolean > 5.00 volts	TOSS fault time > 10.0 seconds UPDATE TOSS latent fault fail count	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			active OR (*default gear option active AND TOSS sensor latent fault fail count)) UPDATE TOSS fault time *default gear option active occurs when emission MIL active due to transmission default gear	 = TRUE = 100 counts	for run crank voltage time vehicle speed trip criteria met when: vehicle speed trip criteria met RunCrankVoltageMet vehicle speed for vehicle speed time THEN SET vehicle speed trip criteria met = TRUE IF P077C or P077D fault active OR P0722 or P0723 test fail this key on SET TOSS fault occur = TRUE	> 12.5 milliseconds = FALSE = TRUE > 18.0 KPH > 120.0 seconds = TRUE = TRUE	SET TOSS fault = TRUE TOSS latent fault fail count > 100 counts 25 millisecond update rate	
			tie-up fault tie-up fault occur RunCrankVoltageMet (*default gear option active OR (*default gear option active AND tie-up latent fault fail count)) UPDATE tie-up fault time *default gear option active occurs when emission MIL active due to transmission default gear	= FALSE = TRUE = TRUE = FALSE = TRUE = 100 counts	test enable calibration RunCrankVoltageMet = TRUE when: run crank voltage for run crank voltage time vehicle speed trip criteria met when: vehicle speed trip criteria met RunCrankVoltageMet vehicle speed for vehicle speed time THEN SET vehicle speed trip criteria met = TRUE IF P077C or P077D fault active OR P0722 or P0723 test fail this key on	= 1 Boolean > 5.00 volts > 12.5 milliseconds = FALSE = TRUE > 18.0 KPH > 120.0 seconds = TRUE = TRUE	tie-up fault time > 10.0 seconds UPDATE tie-up latent fault fail count SET tie-up fault = TRUE tie-up latent fault fail count > 100 counts 25 millisecond update rate	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					SET tie-up fault occur = TRUE			
			trans range fault trans range fault occur RunCrankVoltageMet (*default gear option active OR (*default gear option active AND tie-up latent fault fail count)) UPDATE trans range fault time *default gear option active occurs when emission MIL active due to transmission default gear	= FALSE = TRUE = TRUE = FALSE = TRUE = 100 counts	test enable calibration RunCrankVoltageMet = TRUE when: run crank voltage for run crank voltage time vehicle speed trip criteria met when: vehicle speed trip criteria met RunCrankVoltageMet vehicle speed for vehicle speed time THEN SET vehicle speed trip criteria met = TRUE IF [(P0717or P07C0 or P07BF fault active or P077D or P077C fault active or P723 test fail this key on or P0723 or P077D or P077C or P0722 fault pending or P0716or P07C0 or P07BF or P0717fault pending or P172B or P172Aor P0721 fault pending or P1783 or P17CE fault active or	= 1 Boolean > 5.00 volts > 12.5 milliseconds = FALSE = TRUE > 18.0 KPH > 120.0 seconds = TRUE = TRUE = TRUE = TRUE = TRUE = TRUE = TRUE	trans range fault time > 10.0 seconds UPDATE trans range latent fault fail count SET trans range fault = TRUE trans range latent fault fail count > 100 counts 25 millisecond update rate	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					P1783 or P17CE fault pending or P172AorP172B test fail this key on or P0721 fault active) AND (safety diasble cal not FALSE OR safety enable cal TRUE)] OR [(P176C orP160E or P0963 or P078F or P0707 fault pending or P18AA fault active) AND (safety diasble cal not FALSE OR safety enable cal TRUE)] SET trans range fault occur = TRUE	= TRUE = TRUE = TRUE = 1 Boolean = 0 Boolean = TRUE = TRUE = 1 Boolean = 0 Boolean		
			tie-up test disable fault tie-up test disable fault occur RunCrankVoltageMet (*default gear option active OR (*default gear option active AND tie-up test latent fault fail count)) UPDATE tie-up test latent fault time *default gear option active	= FALSE = TRUE = TRUE = FALSE = TRUE = 100 counts	test enable calibration RunCrankVoltageMet = TRUE when: run crank voltage for run crank voltage time vehicle speed trip criteria met when: vehicle speed trip criteria met RunCrankVoltageMet vehicle speed for vehicle speed time THEN SET vehicle speed trip criteria met = TRUE	= 1 Boolean > 5.00 volts > 12.5 milliseconds = FALSE = TRUE > 18.0 KPH > 120.0 seconds	tie-up test latent fault time > 10.0 seconds UPDATE tie-up test latent fault fail count SET tie-up test disable fault = TRUE tie-up test latent fault fail count > 100 counts 25 millisecond update rate	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			occurs when emission MIL active due to transmission default gear		IF EngineTorqueEstInaccurate AcceleratorPedalFailure OR CrankSensor_FA OR P2534 fault active OR (P0707 test fail this key on OR P0707 fault active OR P0708 test fail this key on OR P0708 fault active OR P2805 fault active OR P27EE fault active OR P27EB fault active OR P27ED fault active OR P17F7 fault active OR P17F5 fault active OR P17F6 fault active OR P17FC fault active OR P17FA fault active OR P17FB fault active) OR (P0716 fault pending, fault active, test fail this key on OR P0717 fault pending, fault active, test fail this key on OR P0721 fault pending, fault active, test fail this key on OR P0722 fault pending, fault active, test fail this key on OR P0723 fault pending, fault active, test fail this key on OR P077B fault oendina. fault	= TRUE = TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					active, test fail this key on	= TRUE
					OR	
					P077C fault pending, fault active, test fail this key on	= TRUE
					OR	
					P077D fault pending, fault active, test fail this key on	= TRUE = TRUE
					OR	
					P07BF fault pending, fault active, test fail this key on	= TRUE
					OR	
					P07C0 fault pending, fault active, test fail this key on	= TRUE
					OR	
					P172A fault pending, fault active, test fail this key on	= TRUE
					OR	
					P172B fault pending, fault active, test fail this key on	= TRUE
					OR	
					P176B fault pending, fault active, test fail this key on	= TRUE
					OR	
					P176C fault pending, fault active, test fail this key on	= TRUE
					OR	
					P176D fault pending, fault active, test fail this key on	= TRUE
					OR	
					P1783 fault pending, fault active, test fail this key on	= TRUE
					OR	
					P178F fault pending, fault active, test fail this key on	= TRUE
					OR	
					P17C4 fault pending, fault active, test fail this key on	= TRUE
					OR	
					P17C5 fault pending, fault active, test fail this key on	= TRUE
					OR	
					P17C6 fault pending, fault	= TRUE

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					active, test fail this key on OR P17C7 fault pending, fault active, test fail this key on OR P17CC fault pending, fault active, test fail this key on OR P17CD fault pending, fault active, test fail this key on OR P17CE fault pending, fault active, test fail this key on OR P17D3 fault pending, fault active, test fail this key on OR P17D6 fault pending, fault active, test fail this key on) SET tie-up test disable fault occur = TRUE	 = TRUE = TRUE = TRUE = TRUE = TRUE = TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Planetary Gearset Ring Gear Speed Sensor Circuit Range/ Performance	P176B	The diagnostic monitor rationalizes the transmission intermediate shaft speed sensor by using the transmission output shaft output speed sensor and the known ratio between the transmission intermediate shaft speed and the transmission output shaft output speed based on the commanded gear and the transmission lever node design. The estimated transmission intermediate shaft speed is equal to the gear ratio times the transmission output shaft output speed. The absolute value of the delta between the measured transmission intermediate shaft speed and the estimated transmission intermediate shaft speed is used to determine if the measured transmission intermediate shaft speed is rational.	deltal = ABS (transmission input speed - (transmission output speed * gear ratio commanded)) update faiil time 25 millisecond update rate	> 25.0 RPM	diagnostic monitor enable speed sesnor configuration calibration is single OR dual ratio calibration is function of command gear and intermediate speed sesnor when not REVERSE ratio calibration is function of command gear and intermediate speed sesnor when REVERSE ********** delay time updates when: estimated transmission intermediate speed (transmission input	= 1 Boolean = CeTNSR_e_NSPD_SingleSpdSnsr **P176B ratio calibration = when not REVERSE** see supporting tables **P176B ratio calibration = when REVERSE** see supporting tables ********** > **P176B minimum estimated transmission intermediate speed to enable fail evaluation**	fail time > **P176B intermediate speed sensor fail time threshold** see supporting tables fail time threshold met increments fail count, fail count > **P176B intermediate speed sensor fail count threshold** see supporting tables ********** delay time >	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					speed / ratio calibration) with transmission input speed input speed sensor ready based on commaned gear and transmission intermediate speed sensor (state output must be FALSE to enable fail evaluation) with with attained gear ********** transmission input speed transmission output speed neutral idle mode range shift state P0716 fault active P0717 fault active P07BF fault active P07C0 fault active P0722 fault active P0723 fault active P077C fault active P077D fault active P176C fault active P176D fault active battery voltage	see supporting tables **P176B minimum transmission input speed to enable fail > evaluation** see supporting tables **P176B holding clutch = states** see supporting tables = REVERSE OR = 1st thru 10th ********** > 172.0 RPM > 89.0 RPM = nuetral idle mode ON = range shift complete = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE > 9.00 volts = FALSE	**P176B delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation** see supporting tables	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					service fast learn active run crank voltage transmission hydraulic pressure available: engine speed	> 9.00 volts > 500.0 RPM	battery voltage time > 0.100 seconds run crank voltage time > 0.100 seconds engine speed time > **engine speed time for transmission hydraulic pressure available** see supporting tables	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Planetary Gearset Ring Gear Speed Sensor Circuit Low	P176C	Controller specific analog circuit diagnoses the transmission intermediate speed sensor and wiring for a short to ground fault by comparing a voltage measurement to controller specific voltage thresholds.	transmission intermediate speed sesnor raw voltage, update fail time, 12.5 millisecond update rate	< 0.25 volts (< 0.5 Q impedance between signal and controller ground)	service mode $04 active diagnostic monitor enable P176D fault active service fast learn run crank voltage battery voltage P176C fault active P176C test fail this key on	= FALSE = 1.00 Boolean = FALSE = FALSE > 10.00 volts > 10.00 volts = FALSE = FALSE	fail time > 0.05 seconds, update fail count, fail count > 40.00 counts 6.25 millisecond update rate run crank and battery voltage time > 5.000 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Planetary Gearset Ring Gear Speed Sensor Circuit High	P176D	Controller specific analog circuit diagnoses the transmission intermediate speed sensor and wiring for a short to voltage fault by comparing a voltage measurement to controller specific voltage thresholds.	transmission intermediate speed sesnor raw voltage, update fail time, 12.5 millisecond update rate	> 4.75 volts (< 0.5 Q impedance between signal and controller power)	service mode $04 active diagnostic monitor enable P176C fault active service fast learn run crank voltage battery voltage P176D fault active P176D test fail this key on	= FALSE = 1.00 Boolean = FALSE = FALSE > 10.00 volts > 10.00 volts = FALSE = FALSE	fail time > 0.05 seconds, update fail count, fail count > 40.00 counts 6.25 millisecond update rate run crank and battery voltage time > 5.000 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intermediate Speed Sensor 1 Direction Not Plausible - Forward	P178F	The intermediate speed sensor 1 is a directional sensor, and raw intermediate speed sensor 1 direction is rationalized based on attained gear. Attained gear is a true indication of gear based on measured gear ratio, TISS/TOSS. Intermediate speed sensor 1 direction can be predicted, based on a function of the attained gear. When the raw intermediate speed sensor 1 direction does not correlate to the predicted direction and does not correlate to the attained gear, the intermediate speed sensor 1 directional is in error.	intermediate speed sensor 1 direction raw AND attained gear	**intermediate speed sensor 1 or 2 # predicted direction** = REVERSE	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >**engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds	2.50 seconds	Type A, 1 Trips
			intermediate speed sensor 1 direction raw AND attained gear AND attained gear	**intermediate speed sensor 1 or 2 # predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >**engine speed time for transmission hydraulic pressure available** seconds	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						> 9.00 volts		
						> 0.100 seconds		
					battery voltage	= FALSE		
					for time	> 9.00 volt		
					service fast learn active	> 0.100 seconds		
					run/crank voltage	= REVERSE		
					for time	= FALSE		
					attained gear			
					P0721 Fault Active	= range shift complete		
					range shift state (auto trans shift complete)	> 1.00 seconds		
					enable time			
			intermediate speed sensor 1 direction raw AND TIS direction AND attained gear	**intermediate speed sensor 1 or 2 # predicted direction** # FORWARD = REVERSE	when the following conditions are met update the enable time:	**speed sensor directional rationality = enable calibration**	2.50 seconds	
					diagnsotic monitor enable			
					TOSS sensor type must be directional	= CeTOSR_e_Directional		
					engine speed	> 500.0 RPM		
					engine speed time	> **engine speed time for transmission hydraulic pressure available** seconds		
					battery voltage	> 9.00 volts		
					for time	> 0.100 seconds		
					service fast learn active	= FALSE		
					run/crank voltage	> 9.00 volt		
					for time	> 0.100 seconds		
					attained gear	= REVERSE		
					P0721 Fault Active	= FALSE		
					range shift state (auto trans shift complete)	= range shift complete		
						> 1.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					enable time			
			intermediate speed sensor 1 direction raw AND raw TIS direction AND attained gear AND attained gear	**intermediate speed sensor 1 or 2** **# predicted direction** # FORWARD > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality** **= enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds	2.50 seconds	
			(intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw) AND attained gear	**intermediate speed sensor 1 or 2** **# predicted direction** **intermediate speed sensor 1 or 2** **# predicted direction** = REVERSE	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed ~~engine speed time~~	**speed sensor directional rationality** **= enable calibration** = CeTOSR_e_Directional > 500.0 RPM >	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						engine speed time for transmission hydraulic pressure available seconds		
					battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active	> 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE		
					range shift state (auto trans shift complete)	= range shift complete		
					enable time	> 1.00 seconds		
			(intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw) AND attained gear AND attained gear	**intermediate speed sensor 1 or 2 # predicted direction** **intermediate speed sensor 1 or 2 # predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >**engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete	2.50 seconds	
					battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					range shift state (auto trans shift complete) enable time	> 1.00 seconds		
			(intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw OR TIS direction) AND attained gear	**intermediate speed sensor 1 or 2 # predicted direction** **intermediate speed sensor 1 or 2 # predicted direction** # FORWARD = REVERSE	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds	2.50 seconds	
			(intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw OR **TIS dirootion) AND**	**intermediate speed sensor 1 or 2 # predicted direction** **intermediate speed sensor 1 or 2 # predicted direction** **f FORWARD**	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			attained gear AND attained gear	> 1st gear < 10th gear	engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	**engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intermediate Speed Sensor 1 Direction Not Plausible - Reverse	P17C4	The intermediate speed sensor 1 is a directional sensor, and raw intermediate speed sensor 1 direction is rationalized based on attained gear. Attained gear is a true indication of gear based on measured gear ratio, TISS/TOSS. Intermediate speed sensor 1 direction can be predicted, based on a function of the attained gear. When the raw intermediate speed sensor 1 direction does not correlate to the predicted direction and does not correlate to the attained gear, the intermediate speed sensor 1 directional is in error.	intermediate speed sensor 1 direction raw AND attained gear	**intermediate speed sensor 1 or 2 # predicted direction** = REVERSE	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >**engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds	2.50 seconds	Type A, 1 Trips
			intermediate speed sensor 1 direction raw AND attained gear AND attained gear	**intermediate speed sensor 1 or 2 # predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >**engine speed time for transmission hydraulic pressure available** seconds	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	> 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds		
			intermediate speed sensor 1 direction raw AND TIS direction AND attained gear	**intermediate speed sensor 1 or 2** **# predicted direction** # FORWARD = REVERSE	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete)	**speed sensor directional rationality** **= enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					enable time			
			intermediate speed sensor 1 direction raw AND raw TIS direction AND attained gear AND attained gear	**intermediate speed sensor 1 or 2** **# predicted direction** # FORWARD > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality** **= enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds	2.50 seconds	
			(intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw) AND attained gear	**intermediate speed sensor 1 or 2** **# predicted direction** **intermediate speed sensor 1 or 2** **# predicted direction** = REVERSE	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed ~~engine speed time~~	**speed sensor directional rationality** **= enable calibration** = CeTOSR_e_Directional > 500.0 RPM >	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						engine speed time for transmission hydraulic pressure available seconds		
					battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active	> 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE		
					range shift state (auto trans shift complete)	= range shift complete		
					enable time	> 1.00 seconds		
			(intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw) AND attained gear AND attained gear	**intermediate speed sensor 1 or 2 # predicted direction** **intermediate speed sensor 1 or 2 # predicted direction** > 1st gear < 10th gear	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time	**speed sensor directional rationality = enable calibration** = CeTOSR_e_Directional > 500.0 RPM >**engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds	2.50 seconds	
					battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active	= FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					range shift state (auto trans shift complete) enable time	> 1.00 seconds		
			(intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw OR TIS direction) AND attained gear	**intermediate speed sensor 1 or 2** **# predicted direction** **intermediate speed sensor 1 or 2** **# predicted direction** # FORWARD = REVERSE	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	**speed sensor directional rationality** **= enable calibration** = CeTOSR_e_Directional > 500.0 RPM > **engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds	2.50 seconds	
			(intermediate speed sensor 1 direction raw OR intermediate speed sensor 2 direction raw OR **TIS dirootion) AND**	**intermediate speed sensor 1 or 2** **# predicted direction** **intermediate speed sensor 1 or 2** **# predicted direction** **f FORWARD**	when the following conditions are met update the enable time: diagnsotic monitor enable TOSS sensor type must be directional	**speed sensor directional rationality** **= enable calibration** = CeTOSR_e_Directional > 500.0 RPM **=**	2.50 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			attained gear AND attained gear	> 1st gear < 10th gear	engine speed engine speed time battery voltage for time service fast learn active run/crank voltage for time attained gear P0721 Fault Active range shift state (auto trans shift complete) enable time	**engine speed time for transmission hydraulic pressure available** seconds > 9.00 volts > 0.100 seconds = FALSE > 9.00 volt > 0.100 seconds = REVERSE = FALSE = range shift complete > 1.00 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Intermediate Speed Sensor 1 Direction Error	P17D3	The diagnostic monitor determines if the direction transmission intermediate speed sensor value is coherent based on the on period time of the directional sensor and raw speed sensor value. When the on period time indicates a transitional state, the direction must also be transitional as measured by very slow raw signal RPM. When the on period time indicates a non-transitional state, forward or reverse, the direction must also be transition, not forward and not reverse.	intermediate speed sesnor raw direction when transitional period = FALSE AND intermediate speed sesnor raw direction when transitional period = FALSE OR intermediate speed sesnor raw when transitional period = TRUE update fail and sample time 6.26 millisecond update rate	# FORWARD # REVERSE **P17C5 P17D3 intermediate speed > sensor RPM**	service mode $04 active diagnostic monitor enable intermediate speed sesnor count sample period P17D3 fault active OR P17D3 test fail this key on senor type calibration (senor type is directional) transitional period detected = FALSE when: on period OR on period when direction unknown OR on period on period when direction is reverse OR on period on period when direction is forward transitional period detected = TRUE when: on period on period when direction unknown	= FALSE = 1 Boolean # 0 counts = FALSE = FALSE = CeTNSR_e_NSPD_SinglesSpdSnsr > 0.4434 seconds < 0.2773 seconds < 0.2363 seconds > 0.1240 seconds < 0.0811 seconds > 0.0088 seconds < 0.4434 seconds > 0.2773 seconds	fail time > 3.500 seconds out of sample time > 5.000 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Position Sensor/ Switch A Circuit/Open	P17F5	The diagnostic monitor detects an illegal voltage on the park valve position sensor circuit.	raw sensor voltage raw sensor voltage	> 1.263 volts < 1.504 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system is internal (CeTRGR e ExternalETRS) OR external (CeTRGR e InternalETRS)	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Position Sensor/ Switch A Circuit Low	P17F6	The diagnostic monitor detects a ground short or open circuit fault in the park valve position sensor circuit.	raw sensor voltage	> 2.538 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system is internal (CeTRGR e ExternalETRS) OR external (CeTRGR e InternalETRS)	1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Position Sensor/ Switch A Circuit High	P17F7	The diagnostic monitor detects a short to voltage circuit fault in the park valve position sensor circuit.	raw sensor voltage	> 2.538 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system is internal (CeTRGR e ExternalETRS) OR external (CeTRGR e InternalETRS)	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Position Sensor/ Switch B Circuit/Open	P17FA	The diagnostic monitor detects an illegal voltage on the park valve position sensor circuit.	raw sensor voltage raw sensor voltage	> 1.263 volts < 1.504 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system is internal (CeTRGR e ExternalETRS) OR external (CeTRGR e InternalETRS)	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Position Sensor/ Switch B Circuit Low	P17FB	The diagnostic monitor detects a ground short or open circuit fault in the park valve position sensor circuit.	raw sensor voltage	< 0.414 volts	diagnostic monitor enable battery voltage battey voltage time ETRS system is internal (CeTRGR e ExternalETRS) OR external (CeTRGR e InternalETRS)	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Position Sensor/ Switch B Circuit High	P17FC	The diagnostic monitor detects a short to voltage circuit fault in the park valve position sensor circuit.	raw sensor voltage	> 2.538 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system is internal (CeTRGR e ExternalETRS) OR external (CeTRGR e InternalETRS)	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Stuck On	P187D	This diagnostic monitor rationalizes the driver ETRS command direction of “out of PARK” against the actual park valve position, as the park valve position is measured by the park valve position sensor A or B.	ETRS commanded direction AND Diagnostic Park State (see diagnostic park state definition) AND Park Servo Position delay time AND fail time increment fail count	# PARK = PARK = PARK > **Park Valve Stk On Dly Lim** >= **Park Valve Stk On Fail Lim**	ETRS Performance Diag Enabl (see ETRS performance Diag Enabl description) diagnostic monitor enable High Side Driver 1 High Side Driver 2 park servo stuck on available (see park servo stuck on definition) (Mode Valve A command pressure AND (((mode valve A state attained AND STGR ModeVIvA Position AND P27EC Test Fail This Key On) OR (Mode Valve A Position AND P27EC Test Fail This Key On)) OR Mode Valve A Snsr FP)) OR (Mode Valve B command pressure AND (((mode valve B state attained AND STGR Mode Vlv B Position AND P27EC Test Fail This Key On) OR (Mode Valve B Position AND P27EC Test Fail This Key On)) OR Mode Valve B Snsr FP))	= TRUE = 1.00 Boolean = TRUE = TRUE = TRUE > 195.00 = TRUE = HIGH = TRUE = HIGH = FALSE = TRUE > 295.00 = TRUE = HIGH = TRUE = HIGH = FALSE = TRUE	fail count > 2 counts update rate 6.25 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					((P17F5, P17F6, P17F7 Fault Active AND P18E7Test Fail This Key On) OR (P17FA, P17FB, P17FC Fault Active AND P18E8Test Fail This Key On)) AND P187D, P187ETest Fail This Key On	= FALSE = FALSE = FALSE = FALSE = FALSE		
			ETRS commanded direction AND Diagnostic Park State (see diagnostic park state definition) AND Park Servo Position delay time AND fail time increment fail count	# PARK = OUT OF PARK # OUT OF PARK > **Park Valve Stk On Dly Lim** >= **Park Valve Stk On Fail Lim**	ETRS Performance Diag Enabl (see ETRS performance Diag Enabl description) diagnostic monitor enable High Side Driver 1 High Side Driver 2 ((ETRS Hydraulic Pressure Avail (see ETRS Hydraulic Pressure Avail description) OR (ETRS commanded direction AND PISA Fail Count (Mode Valve A position OR Mode Valve B position))) ((P17F5, P17F6, P17F7 Fault Active AND P18E7Test Fail This Key On AND Park Position Sensor A) AND (P17FA, P17FB, P17FC Fault Active AND P18E8Test Fail This Key On AND	= TRUE = 1.00 Boolean = TRUE = TRUE = TRUE = NeutLo = 0 # LOW # LOW = FALSE = FALSE # OUT OF PARK = FALSE = FALSE	fail count > 2 counts update rate 6.25 milliseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Park Position Sensor B)) AND P187D, P187ETest Fail This Key On	# OUT OF PARK = FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Stuck Off	P187E	This diagnostic monitor rationalizes the driver ETRS command direction of “PARK” against the actual park valve position, as the park valve position is measured by the mode valve position sensor A and B.	ETRS commanded direction Diagnostic Park State (see diagnostic park state description) Park Servo Position IF ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) (IF 0 line pressure command Delay Limit ELSE Delay Limit) ELSE (IF (High Side Driver 1 High Side Driver 2 Line pressure control in use) Delay Limit ELSE Delay Limit)	= PARK = PARK # PARK = TRUE = TRUE = **Park Vlv Stk OffZL DLy Lim** = **Park Vlv Stk Off Dly Lim** = TRUE = TRUE # Diag Max Pressure = **Park Vlv Stk Off Eng Off Lim** = **Park Vlv Stk Off ML Eng Off Lim**	ETRS Performance Diag Enabl (see ETRS performance Diag Enabl description) diagnostic monitor enable High Side Driver 1 High Side Driver 2 (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) OR ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avil description) AND Power Mode) IF (P18E7Test Fail This Key On AND Park Position Sensor A FPAND P17F5, P17F6, P17F7 Fault Active AND Park Position Sensor A) ELSE (P18E7Test Fail This Key On OR Park Position Sensor A FPOR P17F5, P17F6, P17F7 Fault Active) ((P17F5, P17F6, P17F7 Fault Active AND P18E7Test Fail This Key On) OR (P17FA, P17FB, P17FC Fault Active AND P18E8Test Fail This Key	= TRUE = 1.00 = TRUE = TRUE = TRUE = FALSE # OFF = FALSE = FALSE =FALSE # PARK = TRUE = TRUE = TRUE = FALSE = FALSE = FALSE = FALSE	Delay Time > Delay Limit Increment fail time fail time > **Park Valve Stuck Off Fail Lim** Increment fail counter Fail counter > 2.00 update rate 6.25 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					On)) AND P187D, P187ETest Fail This Key On	= FALSE		
			ETRS commanded direction Diagnostic Park State (see diagnostic park state description) Park Servo Position Park Position Sensor A IF ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) (IF 0 line pressure command Delay Limit ELSE Delay Limit) ELSE IF (High Side Driver 1 High Side Driver 2 Line pressure control in use) Delay Limit ELSE Delay Limit	# PARK = PARK # OUT OF PARK = OUT OF PARK = TRUE = TRUE = **Park Vlv Stk OffZL DLy Lim** = **Park Vlv Stk Off Dly Lim** = TRUE = TRUE # Diag Max Pressure = **Park Vlv Stk Off Eng Off Lim** = **Park Vlv Stk Off ML Eng Off Lim**	ETRS Performance Diag Enabl (see ETRS performance Diag Enabl description) diagnostic monitor enable High Side Driver 1 High Side Driver 2 IF P18E7Test Fail This Key On AND Park Position Sensor A FPAND P17F5, P17F6, P17F7 Fault Active AND Park Position Sensor A ((P17F5, P17F6, P17F7 Fault Active AND P18E7Test Fail This Key On) OR (P17FA, P17FB, P17FC Fault Active AND P18E8Test Fail This Key On)) AND P187D, P187ETest Fail This Key On	= TRUE = 1.00 = TRUE = TRUE = FALSE = FALSE =FALSE = FALSE = FALSE = FALSE = FALSE = FALSE	Delay Time > Delay Limit Increment fail time fail time > **Park Valve Stuck Off Fail Lim** Increment fail counter Fail counter > 2.00 update rate 6.25 milliseconds	
			ETRS oommondod	~ PARK	ETRS PorformonooDiag	TRUE	Delay Timo	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			direction Diagnostic Park State (see diagnostic park state description) Park Servo Position IF ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) (IF 0 line pressure command Delay Limit ELSE Delay Limit) ELSE (IF (High Side Driver 1 High Side Driver 2 Line pressure control in use) Delay Limit ELSE Delay Limit)	= OUT OF PARK # PARK = TRUE = TRUE = **Park Vlv Stk OffZL DLy Lim** = **Park Vlv Stk Off Dly Lim** = TRUE = TRUE # Diag Max Pressure = **Park Vlv Stk Off Eng Off Lim** = **Park Vlv Stk Off ML Eng Off Lim**	Enabl (see ETRS performance Diag Enabl description) diagnostic monitor enable High Side Driver 1 High Side Driver 2 IF ((((Mode Valve A state attained Or Mode Valve A sensor FP OR P18ABTest Fail This Key On OR P27EC Test Fail This Key On) && Mode Valve A commanded pressure) OR ((Mode Valve B state attained Or Mode Valve B sensor FP OR P18ACTest Fail This Key On OR P27F0 Test Fail This Key On) && Mode Valve B commanded pressure))) OR 0 line pressure command ((P17F5, P17F6, P17F7 Fault Active AND P18E7Test Fail This Key On) OR (P17FA, P17FB, P17FC Fault Active AND P18E8Test Fail This Key On)) AND	= 1.00 = TRUE = TRUE = TRUE = TRUE = TRUE = TRUE < 195.00 = TRUE = TRUE = TRUE = TRUE < 295.00 = TRUE = FALSE = FALSE = FALSE = FALSE	Delay Limit Increment fail time fail time > **Park Valve Stuck Off Fail Lim** Increment fail counter Fail counter > 2.00 update rate 6.25 milliseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					P187D, P187ETest Fail This Key On	= FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Inhibit Actuator Control Circuit Low	P18A2	Controller specific circuit diagnoses internal ETRS park solenoid for an ground short or open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit Increment fail time	> 200 K Q impedance between signal and controller ground OR < 0.5 Q impedance between signal and controller ground	((battery voltage AND battery voltage AND for battery voltage time run crank voltage for run crank voltage time) OR accessory voltage active)) diagnostic monitor enable calibration	> 9.00 volts < 32.00 volts > 1.000 seconds > 5.00 volts > 25 milliseconds = TRUE for 12.5 milliseconds = 1 Boolean	fail time > 0.100 seconds out of sample time > 0.166 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Inhibit Actuator Control Circuit	P18A3	Controller specific circuit diagnoses internal ETRS park solenoid for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit Increment fail time	> 200 K Q impedance between signal and controller ground OR < 0.5 Q impedance between signal and controller ground	((battery voltage AND battery voltage AND for battery voltage time run crank voltage for run crank voltage time) OR accessory voltage active)) diagnostic monitor enable calibration	> 9.00 volts < 32.00 volts > 1.000 seconds > 5.00 volts > 25 milliseconds = TRUE for 12.5 milliseconds = 1 Boolean	fail time > 0.100 seconds out of sample time > 0.166 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Inhibit Actuator Control Circuit High	P18A4	Controller specific circuit diagnoses internal ETRS park solenoid for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage Increment fail time	< 0.5 Q impedance between signal and controller voltage source	((battery voltage AND battery voltage AND for battery voltage time run crank voltage for run crank voltage time) OR accessory voltage active)) diagnostic monitor enable calibration	> 9.00 volts < 32.00 volts > 1.000 seconds > 5.00 volts > 25 milliseconds = TRUE for 12.5 milliseconds = 1 Boolean	fail time > 0.100 seconds out of sample time > 0.166 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Park Inhibit Solenoid Stuck Off	P18A8	This diagnostic monitor rationalizes the park inhibit solenoid based on the driver ETRS command direction and mode valve states.	((ETRS Command Direction OR ETRS Hydraulic Pressurse Avail (see ETRS hydraulic pressure avail description)) AND Diagnostic Park State (see diagnostic park state definition) AND Park Servo Position) IF (Mode Valve A position Mode Valve B position Park position sensor A Park position sensor B) ELSE IF (PISA Fail Counter Park Servo Position Prev Park Servo Position Park Position Sensor B) SET PISA Stk Off Fault Pending = TRUE IF ETRS Hydraulic Pressurse Avail (see ETRS hydraulic pressure avail description) Fail Count Lim ELSE Fail Count Lim IF PISA Stk Off Fault Pending AND	= NeutLo = FALSE = OUT OF PARK # OUT OF PARK = LOW = LOW = PARK = PARK > 0 = OUT OF PARK # OUT OF PARK = PARK = TRUE = 3.00 = 3.00 = TRUE	ETRS Performance Diag Enabl (see ETRS performance Diag Enabl description) diagnostic monitor enable High Side Driver 1 High Side Driver 2 P18A8Test Fail This Key On AND (P187E, P187DTest Fail This Key On) AND AND (P18A2, P18A3, P18A4 Fault Active) AND (P17F5, P17F6, P17F7 Fault Active) AND (P17FA, P17FB, P17FC Fault Active) AND (P27EC, P27F0 Test Fail This Key On)	= TRUE = 1.00 = TRUE = TRUE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE	PISA Fail Counters Fail Count Lim update rate 6.25 milliseconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			PISA Stk Off Fault Pending Increment PISA Fail Counter SET PISA Stk Off Fault Pending = FALSE	= FALSE				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control Valve A Stuck On	P18AA	This diagnostic monitor detects a Mode Valve A Position Sensor State in the "on" or "high" state, which is in error, when commanded hydraulic pressure in the circuit used to move the mode valve is not sufficient to overcome the mode valve return spring force, leaving the mode valve mechanically in the “off” or “low” state.	Mode Valve A Position IF (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail descritpion) IF (Mode Valve A Trnstn Fault Pending AND Mode Valve A St Fnl Fault Pending) MVA Fail Limit ELSE IF (Mode Valve A Trnstn Fault Pending) MVA Fail Limit ELSE IF (Mode Valve A St Fnl Fault Pending) MVA Fail Limit ELSE	# LOW = TRUE = FALSE = FALSE = **Mode Valve A Fail Lim** = TRUE = ModeVlvA_TrnstnDly [ETRS diagnostic range][ETRS commanded direction] (see supporting tables for specific delay associated with each shift) = TRUE = ModeVlvA_FnlDly [ETRS diagnostic range][ETRS commanded direction] (see supporting tables for specific delay associated with each shift)ModeVlvlA_	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) Auto-Stop Active High Side Driver 1 High Side Driver 2 ETRS commanded direction ((Driver command P2812 Fault Active P2815 Fault Active P0970 Fault Active P2720 Fault Active) OR (Driver command P2814 Fault Active (P0968 Fault Active P0971 Fault Active) OR (P2718 Fault Active P2721 Fault Active))) Mode Enbl Vlv Stk On Test P18AFTest Fail This Key On IF (((Mode Valve A St Attnd (see mode valve A st attnd description) AND Mode Valve A Trnstn (see mode valve A trnstn description))AND (Diagnostic Range OR Mode Valve B Trnstn (see	= TRUE = TRUE = FALSE = TRUE = TRUE # ETRS diagnostic range = Park = FALSE = FALSE = FALSE = FALSE # Park = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = NeutShf = TRUE	When: ((Park is commanded AND fail count >= 2.00) OR (Park is not commanded AND fail count >= 2.00)) update rate 6.25 milleseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					mode valve B trnstn description) OR			
			IF (High Side Driver 1 AND High Side Driver 2 AND Line pressure Command)	= TRUE = TRUE # Diag Max Press	Mode Valve B St Attnd (see mode valve B st attnd description) OR (0 line pressure command AND Mode Valve A Position)))	= TRUE = TRUE = HIGH		
			MVA Fail Limit ELSE	= **Mode Valve A Eng Off Dly Lim**	IF Diagnostic Enable AND Mode Valve A pressure command ((ETRS commanded direction AND ETRS diagnostic range AND 0 line pressure command) OR (ETRS commanded direction AND ETRS diagnostic range AND line pressure command)	= 1.00 < 25.00 # Drive or NeutShf or Park = Drive or NeutShf #TRUE = NeutShf = Drive = 0		
			MVA Fail Limit Increment MVA Fail Timer	= **Mode Valve A Eng Off ML Lim**				
			IF (MVA Fail Timer	> MVA Fail Limit				
			IF (Mode Valve ATrnstn (see mode valve A trnstn description) Set Mode Valve A St Fnl Fault Pending)	= TRUE = TRUE	Increment Delay Timer			
			ELSE (Set Mode Valve A Trnstn Fault Pending)) Increment fail counter Set MVA Fail Timer = 0	= TRUE	Delay Limit	= ModeVlvA_TrnstnDly [ETRS diagnostic range] [ETRS commanded direction] (see supporting tables for specific delay associated with each shift)		
				ModeVlvA_TrnstnDly [ETRS attained range Drive, ETRS command range NeutHi]	Delay Timer Set Mode Valve A sensor Fault Pending IF	> Delay Limit		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvA_TrnstnDly [ETRS attained range Drive, ETRS command range NeutLo] **ModeVlvA_TrnstnDly [ETRS attained range Drive, ETRS command range NeutShf]** **ModeVlvA_TrnstnDly [ETRS attained range Drive, ETRS command range Park]** **ModeVlvA_TrnstnDly [ETRS attained range NeutShf, ETRS command range NeutHi]** **ModeVlvA_TrnstnDly [ETRS attained range NeutShf, ETRS command range NeutLo]** **ModeVlvA_TrnstnDly [ETRS attained range NeutShf, ETRS command range Park]** **ModeVlvA_TrnstnDly [ETRS attained range NeutShf, ETRS command range Reverse]** **ModeVlvA_FnlDly [ETRS attained range Park, ETRS command range NeutLo]**	(Mode Valve A sensor Fault Pending AND (ETRS Commanded Dirctn AND (Park Servo Position OR 0 line pressure command)) OR ETRS Commanded Dirctn) Execute Mode Valve A Fail P18AATest Fail This Key On P27EB Fault Active P27ED Fault Active P27EE Fault Active P18ABTest Fail This Key On P27EC Test Fail This Key On	= TRUE = PARK # PARK = TRUE = REVERSE, NeutLo, NeutHi, or NeutShf = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvA_TrnstnDly [ETRS attained range NeutHi, ETRS command range NeutLo] ModeVlvA_TrnstnDly [ETRS attained range NeutHi, ETRS command range Park] ModeVlvA_TrnstnDly [ETRS attained range NeutHi, ETRS command range Reverse] ModeVlvA_TrnstnDly [ETRS attained range NeutLo, ETRS command range NeutHi] ModeVlvA_TrnstnDly [ETRS attained range NeutLo, ETRS command range Park] ModeVlvA_TrnstnDly [ETRS attained range NeutLo, ETRS command range Reverse] ModeVlvA_TrnstnDly [ETRS attained range Park, ETRS command range NeutHi] ModeVlvA_TrnstnDly [ETRS attained range Park, ETRS command range Reverse]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvA_TrnstnDly [ETRS attained range Reverse, ETRS command range NeutHi] ModeVlvA_TrnstnDly [ETRS attained range Reverse, ETRS command range NeutLo] ModeVlvA_TrnstnDly [ETRS attained range Reverse, ETRS command range Park] ModeVlvA_FnlDly [ETRS attained range Drive, ETRS command range NeutHi] ModeVlvA_FnlDly [ETRS attained range Drive, ETRS command range NeutLo] ModeVlvA_FnlDly [ETRS attained range Drive, ETRS command range NeutShf] ModeVlvA_FnlDly [ETRS attained range Drive, ETRS command range Park] ModeVlvA_FnlDly [ETRS attained range Drive, ETRS command range Reverse]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvA_FnlDly [ETRS attained range NeutHi, ETRS command range Drive] ModeVlvA_FnlDly [ETRS attained range NeutHi, ETRS command range NeutLo] ModeVlvA_FnlDly [ETRS attained range NeutHi, ETRS command range NeutShf] ModeVlvA_FnlDly [ETRS attained range NeutHi, ETRS command range Park] ModeVlvA_FnlDly [ETRS attained range NeutHi, ETRS command range Reverse] ModeVlvA_FnlDly [ETRS attained range NeutLo, ETRS command range Drive] ModeVlvA_FnlDly [ETRS attained range NeutLo, ETRS command range NeutHi] ModeVlvA_FnlDly [ETRS attained range NeutLo, ETRS command range NeutShf]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvA_FnlDly [ETRS attained range NeutLo, ETRS command range Park] ModeVlvA_FnlDly [ETRS attained range NeutLo, ETRS command range Reverse] ModeVlvA_FnlDly [ETRS attained range NeutShf, ETRS command range Drive] ModeVlvA_FnlDly [ETRS attained range NeutShf, ETRS command range NeutHi] ModeVlvA_FnlDly [ETRS attained range NeutShf, ETRS command range NeutLo] ModeVlvB_FnlDly [ETRS attained range NeutShf, ETRS command range Park] ModeVlvB_FnlDly [ETRS attained range NeutShf, ETRS command range Reverse] ModeVlvA_FnlDly [ETRS attained range Park, ETRS command range Drive]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvA_FnlDly [ETRS attained range Park, ETRS command range NeutHi] ModeVlvA_FnlDly [ETRS attained range Park, ETRS command range NeutShf] ModeVlvA_FnlDly [ETRS attained range Park, ETRS command range Reverse] ModeVlvA_FnlDly [ETRS attained range Reverse, ETRS command range Drive] ModeVlvA_FnlDly [ETRS attained range Reverse, ETRS command range NeutHi] ModeVlvA_FnlDly [ETRS attained range Reverse, ETRS command range NeutLo] ModeVlvA_FnlDly [ETRS attained range Reverse, ETRS command range NeutShf] ModeVlvA_TrnstnDly [ETRS attained range Reverse, ETRS command range Park]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Mode Valve A Position ETRS commanded direction AND mode valve A pressure IF (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail descritpion) IF (Mode Valve A Trnstn Fault Pending AND Mode Valve A St Fnl Fault Pending) MVA Fail Limit Increment MVA Fail Timer	# LOW # Drive or NeutShf <= 25.00 = TRUE = FALSE = FALSE = **Mode Valve A Fail Lim**	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) ETRS commanded direction P18AATest Fail This Key On P27EB Fault Active P27ED Fault Active P27EE Fault Active P18ABTest Fail This Key On P27EC Test Fail This Key On IF (Mode Valve A Position OR Mode Valve A Position) Increment Steady State Delay Steady State Delay IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control))	= TRUE = TRUE = ETRS diagnostic range = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE ≠ **Mode Valve A Final State** # Mode Valve A Command > **Mode Vlv StdySt Park Dly Lim** = PARK # PARK < 450.00 = Diag Min Press	MVA Fail Timer > MVA Fail Limit update rate 6.25 milleseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Execute Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control)) Execute Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control) Execute Fail ELSE Increment Slip Delay Slip Delay Slip Detected (see mode valve slip detected definition) Execute Fail	 = NeutLo = PARK < 450.00 = Diag Min Press = DRIVE || REVERSE = PARK > 450.00 # Diag Min Press > **ETRS Mode Valve A turbine delay** = Slip Detected		
			Mode Valve A Position ETRS command direction AND mode valve A pressure	# LOW # NeutShf < 195.00	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic	= TRUE = FALSE	IF Mode Valve A Engine Off Fault Pending = TRUE Increment MVA	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			IF ((High Side Driver 1 AND High Side Driver 2 AND Line Pressure Control) MVA engine off delay lim AND MVA engine off fail lim) ELSE MVA engine off delay lim AND MVA engine off fail lim Increment MVA engine off delay MVA engine off delay Set Mode Valve A Engine Off Fault Pending	= TRUE = TRUE # Diag Max Pres = **Mode Valve A Eng Off Dly Lim** = **Mode Valve A Eng Off ML Lim** > MVA engine off delay lim = TRUE	pressure avail description) AND (hydraulic system pressure available OR auto stop active) GF9 engine off diagnsotic enable P18AATest Fail This Key On P27EB Fault Active P27ED Fault Active P27EE Fault Active	= FALSE = TRUE = 1.00 Boolean = FALSE = FALSE = FALSE = FALSE	engine off fail timer MVA engine off fail timer > MVA engine off fail lime update rate 6.25 milleseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control Valve A Stuck Off	P18AB	This diagnostic monitor detects a Mode Valve A Position Sensor State in the "off" or "low" state, which is in error, when hydraulic pressure in the circuit used to move the mode valve is sufficient to overcome the mode valve return spring force, leaving the mode valve mechanically in the “on” or “high” state. The diagnostic monitor also executes during transitions of the mode valve to verify Mode Valve A Position Sensor State changes correctly with mode valve state command.	Mode Valve A Position ETRS commanded direction AND mode valve A pressure IF (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail descritpion) IF (Mode Valve A Trnstn Fault Pending AND Mode Valve A St Fnl Fault Pending) MVA Fail Limit Increment MVA Fail Timer	# HIGH = Drive OR NeutShf > 195.00 = TRUE = FALSE = FALSE = **Mode Valve A Fail Lim**	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) ETRS commanded direction P18AATest Fail This Key On P27EB Fault Active AND P27ED Fault Active AND P27EE Fault Active AND P18ABTest Fail This Key On AND P27EC Test Fail This Key On IF (Mode Valve A Position OR Mode Valve A Position) Increment Steady State Delay Steady State Delay IF (ETRS Commanded Dirctn) Execute Fail ELSE IF (ETRS Commanded Dirctn IF	= TRUE = TRUE = ETRS diagnostic range = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE ≠ **Mode Valve A Final State** # Mode Valve A Command > **Mode Vlv StdySt Park Dly Lim** = NeutShf = NeutLo = PARK	MVA Fail Timer > MVA Fail Limit update rate 6.25 milleseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(Park Servo State OR Line Pressure OR Line Pressure Control)) Execute Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control) Execute Fail ELSE Increment Slip Delay Slip Delay Slip Detected (see mode valve slip detected definition) Execute Fail	< 450.00 = Diag Min Press = DRIVE || REVERSE = PARK > 450.00 # Diag Min Press > **ETRS Mode Valve A turbine delay** = Slip Detected		
			Mode Valve A Position IF (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail descritpion) IF (Mode Valve A Trnstn Fault Pending AND Mode Valve A St Fnl Fault Pending)	# HIGH = TRUE = FALSE = FALSE	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) Auto-Stop Active High Side Driver 1 High Side Driver 2 ETRS commanded direction	= TRUE = TRUE = FALSE = TRUE = TRUE # ETRS diagnostic range	fail count > 2.00 update rate 6.25 milleseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			MVA Fail Limt ELSE IF (Mode Valve A Trnstn Fault Pending) MVA Fail Limt ELSE IF (Mode Valve A St Fnl Fault Pending) MVA Fail Limt ELSE IF (High Side Driver 1 AND High Side Driver 2 AND Line pressure Command) MVA Fail Limt ELSE MVA Fail Limt Increment MVA Fail Timer	= **Mode Valve A Fail Lim** = TRUE = ModeVlvA_TrnstnDly [ETRS diagnostic range][ETRS commanded direction] (see supporting tables for specific delay associated with each shift) = TRUE = ModeVlvA_FnlDly [ETRS diagnostic range][ETRS commanded direction] (see supporting tables for specific delay associated with each shift)ModeVlvlA_ = TRUE = TRUE # Diag Max Press = **Mode Valve A Eng Off Dly Lim** = **Mode Valve A Eng Off ML Lim**	((Driver command P2812 Fault Active P2815 Fault Active P0970 Fault Active P2720 Fault Active) OR (Driver command P2814 Fault Active (P0968 Fault Active P0971 Fault Active) OR (P2718 Fault Active P2721 Fault Active))) Mode Enbl Vlv Stk On Test P18AFTest Fail This Key On IF (((Mode Valve A St Attnd (see mode valve A st attnd description) AND Mode Valve A Trnstn (see mode valve A trnstn description))AND (Diagnostic Range OR Mode Valve B Trnstn (see mode valve B trnstn description) OR Mode Valve B St Attnd (see mode valve B st attnd description) OR (0 line pressure command AND Mode Valve A Position))) IF Diagnostic Enable AND Mode Valve A pressure	= Park = FALSE = FALSE = FALSE = FALSE # Park = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = NeutShf = TRUE = TRUE = TRUE = HIGH = 1.00 > 195.00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					command			
			IF (MVA Fail Timer	> MVA Fail Limit	((ETRS commanded direction OR	= Drive or NeutShf		
			IF (Mode Valve ATrnstn (see mode valve A trnstn description)	= TRUE	(ETRS Commanded Dirctn AND ETRS diagnostic range)	= NeutLo = Park		
			Set Mode Valve A St Fnl Fault Pending)	= TRUE	AND 0 line pressure command)	= FALSE		
			ELSE		Increment Delay Timer Delay Limit	= ModeVlvA_TrnstnDly [ETRS diagnostic range] [ETRS commanded direction] (see supporting tables for specific delay associated with each shift)		
			(Set Mode Valve A Trnstn Fault Pending))	= TRUE				
			Increment fail counter					
			Set MVA Fail Timer = 0		Delay Timer	> Delay Limit		
				ModeVlvA_TrnstnDly [ETRS attained range Drive, ETRS command range NeutShf]	Set Mode Valve A sensor Fault Pending	= TRUE		
				ModeVlvA_TrnstnDly [ETRS attained range NeutHi, ETRS command range Drive]	IF (Mode Valve A sensor Fault Pending	= TRUE		
				ModeVlvA_TrnstnDly [ETRS attained range NeutHi, ETRS command range NeutShf]	IF (ETRS Commanded Dirctn AND ETRS Diagnostic Range)	= Drive # Park		
				ModeVlvA_TrnstnDly [ETRS attained range NeutLo, ETRS command range Drive]	Execute Mode Valve A Fail IF (ETRS Commanded Dirctn AND ETRS Diagnostics Range AND Park Servo Position)	= Drive or NeutLo = Park = PARK		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvA_TrnstnDly [ETRS attained range NeutLo, ETRS command range NeutShf] **ModeVlvA_TrnstnDly [ETRS attained range NeutShf, ETRS command range Drive]** **ModeVlvA_TrnstnDly [ETRS attained range Park, ETRS command range Drive]** **ModeVlvA_TrnstnDly [ETRS attained range Park, ETRS command range NeutLo]** **ModeVlvA_TrnstnDly [ETRS attained range Reverse, ETRS command range Drive]** **ModeVlvA_TrnstnDly [ETRS attained range Reverse, ETRS command range NeutShf]**	Execute Mode Valve A Fail IF (ETRS Commanded Dirctn) Execute Mode Valve A Fail) P18AATest Fail This Key On P27EB Fault Active P27ED Fault Active P27EE Fault Active P18ABTest Fail This Key On P27EC Test Fail This Key On	= NeutShf = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control Valve B Stuck On	P18AC	This diagnostic monitor detects a Mode Valve B Position Sensor State in the "on" or "high" state, which is in error, when hydraulic pressure in the circuit used to move the mode valve is not sufficient to overcome the mode valve return spring force, leaving the mode valve mechanically in the “off” or “low” state.	Mode Valve B Position ETRS commanded direction AND mode valve B pressure IF (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail descritpion) IF (Mode Valve B Trnstn Fault Pending AND Mode Valve B St Fnl Fault Pending) MVB Fail Limit Increment MVA Fail Timer	# LOW = Drive, NeutLo, Park <= 25.00 = TRUE = FALSE = FALSE = **Mode Valve B Fail Lim**	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) ETRS commanded direction P18ACTest Fail This Key On P27EF Fault Active P27F1 Fault Active P27F2 Fault Active P18ADTest Fail This Key On P27F0 Test Fail This Key On IF (Mode Valve B Position OR Mode Valve B Position) Increment Steady State Delay Steady State Delay IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control))	= TRUE = TRUE = ETRS diagnostic range = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE ≠ **Mode Valve B Final State** # Mode Valve B Command > **Mode Vlv StdySt Park Dly Lim** = PARK # PARK < 450.00 = Diag Min Press	MVB Fail Timer > MVB Fail Limit update rate 6.25 milleseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Execute Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control)) Execute Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control) Execute Fail ELSE Increment Slip Delay Slip Delay Slip Detected (see mode valve slip detected definition) Execute Fail	 = NeutLo = PARK < 450.00 = Diag Min Press = DRIVE || REVERSE = PARK > 450.00 # Diag Min Press > **ETRS Mode Valve B turbine delay** = Slip Detected		
			Mode Valve A Position IF (ETRS Hydraulic	# LOW = TRUE	ETRS Performance Diag Enabl (see ETRS performance diag enabl description)	= TRUE	When: ((Park is commanded AND	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Pressure Avail (see ETRS hydraulic pressure avail descritpion) IF (Mode Valve B Trnstn Fault Pending AND Mode Valve A St Fnl Fault Pending) MVB Fail Limit ELSE IF (Mode Valve B Trnstn Fault Pending) MVB Fail Limit ELSE IF (Mode Valve B St Fnl Fault Pending) MVB Fail Limit ELSE IF (High Side Driver 1 AND High Side Driver 2 AND	 = FALSE = FALSE = **Mode Valve B Fail Lim** = TRUE = ModeVlvB_TrnstnDly [ETRS diagnostic range][ETRS commanded direction] (see supporting tables for specific delay associated with each shift) = TRUE = ModeVlvB_FnlDly [ETRS diagnostic range][ETRS commanded direction] (see supporting tables for specific delay associated with each shift)ModeVlvlA_ = TRUE = TRUE	ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) Auto-Stop Active High Side Driver 1 High Side Driver 2 ETRS commanded direction ((Driver command P2812 Fault Active P2815 Fault Active P0970 Fault Active P2720 Fault Active) OR (Driver command P2814 Fault Active (P0968 Fault Active P0971 Fault Active) OR (P2718 Fault Active P2721 Fault Active))) Mode Enbl Vlv Stk On Test P18AFTest Fail This Key On IF ((((Mode Valve B St Attnd (see mode valve B st attnd description) AND Mode Valve B Trnstn (see mode valve B trnstn description))AND (Diagnostic Range OR Mode Valve A Trnstn (see mode valve A trnstn description) OR Mode Valve A St Attnd	= TRUE = FALSE = TRUE = TRUE # ETRS diagnostic range = Park = FALSE = FALSE = FALSE = FALSE # Park = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = NeutShf = TRUE = TRUE	fail count >= 2.00) OR (Park is not commanded AND fail count >= 2.00))transition fail > update rate 6.25 milleseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Line pressure Command)	# Diag Max Press	(see mode valve A st attnd description) OR			
			MVB Fail Limit	= **Mode Valve B Eng Off Dly Lim**	(0 line pressure command AND Mode Valve B Position)))	= TRUE = HIGH		
			ELSE					
			MVB Fail Limit	= **Mode Valve B Eng Off ML Lim**	IF Diagnostic Enable AND Mode Valve B pressure command	= 1.00 < 25.00		
			Increment MVA Fail Timer					
			IF (MVB Fail Timer	> MVB Fail Limit	(ETRS commanded direction AND ETRS Diagnostic Range)	= Drive, NeutLo, Park = Reverse, NeutHi, NeutShf		
			IF (Mode Valve B Trnstn (see mode valve A trnstn description)	= TRUE	Increment Delay Timer			
			Set Mode Valve B St Fnl Fault Pending)	= TRUE	Delay Limit	= ModeVlvB_TrnstnDly [ETRS diagnostic range] [ETRS commanded direction] (see supporting tables for specific delay associated with each shift)		
			ELSE					
			(Set Mode Valve B Trnstn Fault Pending))	= TRUE	Delay Timer	> Delay Limit		
			Increment fail counter		Set Mode Valve B sensor Fault Pending	= TRUE		
			Set MVB Fail Timer = 0					
				ModeVlvB_TrnstnDly [ETRS attained range NeutHi, ETRS command range Drive]	IF (Mode Valve B sensor Fault Pending AND (ETRS Commanded Dirctn AND (Park Servo Position OR 0 line pressure command))	= TRUE = Park # PARK = TRUE		
				ModeVlvB_TrnstnDly [ETRS attained range NeutHi, ETRS command range NeutLol	Execute Mode Valve B Fail			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvB_TrnstnDly [ETRS attained range NeutHi, ETRS command range Park] **ModeVlvB_TrnstnDly [ETRS attained range NeutShf, ETRS command range Drive]** **ModeVlvB_TrnstnDly [ETRS attained range NeutShf, ETRS command range NeutLo]** **ModeVlvB_TrnstnDly [ETRS attained range NeutShf, ETRS command range Park]** **ModeVlvB_TrnstnDly [ETRS attained range Reverse, ETRS command range Drive]** **ModeVlvB_TrnstnDly [ETRS attained range Reverse, ETRS command range NeutLo]** **ModeVlvB_TrnstnDly [ETRS attained range Reverse, ETRS command range Park]** **ModeVlvB_FnlDly [ETRS attained range Drive, ETRS command range NeutLo]**	IF ETRS Commanded Dirctn Execute Mode Valve B Fail) IF ((Mode Valve B Trnstn (see mode valve B trnstn description) AND (Mode Valve A Trnstn (see mode valve A trnstn description) OR Mode Valve A St Attnd (see mode valve A st attnd description) OR P27EC Fault Active OR Mode Valve A sensor Fault Pending) (ETRS commanded direction AND ETRS Diagnostic Range) Increment Delay Timer Final Limit Final Timer Set Mode Valve B sensor Fault Pending IF Mode Valve B sensor	= Drive or NeutLo = TRUE = TRUE = TRUE = TRUE = TRUE = Park or NeutLo = Drive or Park = ModeVlvB_FnlDly [ETRS diagnostic range] [ETRS commanded direction] (see supporting tables for specific delay associated with each shift) > Final Limit = TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvB_FnlDly [ETRS attained range Drive, ETRS command range Park] **ModeVlvB_FnlDly [ETRS attained range Park, ETRS command range NeutLo]** **ModeVlvB_TrnstnDly [ETRS attained range NeutLo, ETRS command range Drive]** **ModeVlvB_TrnstnDly [ETRS attained range NeutLo, ETRS command range Park]** **ModeVlvB_TrnstnDly [ETRS attained range Park, ETRS command range Drive]** **ModeVlvB_FnlDly [ETRS attained range Drive, ETRS command range NeutHi]** **ModeVlvB_FnlDly [ETRS attained range Drive, ETRS command range NeutLo]** **ModeVlvB_FnlDly [ETRS attained range Drive, ETRS command range NeutShfl**	Fault Pending Execute Mode Valve B Fail) P18ACTest Fail This Key On P27EF Fault Active P27F1 Fault Active P27F2 Fault Active P18ADTest Fail This Key On P27F0 Test Fail This Key On	 = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvB_FnlDly [ETRS attained range Drive, ETRS command range Reverse] ModeVlvB_FnlDly [ETRS attained range NeutHi, ETRS command range Drive] ModeVlvB_FnlDly [ETRS attained range NeutHi, ETRS command range NeutLo] ModeVlvB_FnlDly [ETRS attained range NeutHi, ETRS command range NeutShf] ModeVlvB_FnlDly [ETRS attained range NeutHi, ETRS command range Park] ModeVlvB_FnlDly [ETRS attained range NeutHi, ETRS command range Reverse] ModeVlvB_FnlDly [ETRS attained range NeutLo, ETRS command range Drive] ModeVlvB_FnlDly [ETRS attained range NeutLo, ETRS command range NeutHi]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvB_FnlDly [ETRS attained range NeutLo, ETRS command range NeutShf] ModeVlvB_FnlDly [ETRS attained range NeutLo, ETRS command range Park] ModeVlvB_FnlDly [ETRS attained range NeutLo, ETRS command range Reverse] ModeVlvB_FnlDly [ETRS attained range NeutShf, ETRS command range Drive] ModeVlvB_FnlDly [ETRS attained range NeutShf, ETRS command range NeutHi] ModeVlvB_FnlDly [ETRS attained range NeutShf, ETRS command range NeutLo] ModeVlvB_FnlDly [ETRS attained range NeutShf, ETRS command range Park] ModeVlvB_FnlDly [ETRS attained range NeutShf, ETRS command range Reverse]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvB_FnlDly [ETRS attained range Park, ETRS command range Drive] ModeVlvB_FnlDly [ETRS attained range Park, ETRS command range NeutHi] ModeVlvB_FnlDly [ETRS attained range Park, ETRS command range NeutShf] ModeVlvB_FnlDly [ETRS attained range Park, ETRS command range Reverse] ModeVlvB_FnlDly [ETRS attained range Reverse, ETRS command range Drive] ModeVlvB_FnlDly [ETRS attained range Reverse, ETRS command range NeutHi] ModeVlvB_FnlDly [ETRS attained range Reverse, ETRS command range NeutLo] ModeVlvB_FnlDly [ETRS attained range Reverse, ETRS command range NeutShf]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvB_FnlDly [ETRS attained range Reverse, ETRS command range Park]				
			Mode Valve A Position ETRS command direction AND mode valve B pressure IF ((High Side Driver 1 AND High Side Driver 2 AND Line Pressure Control) MVB engine off delay lim AND MVB engine off fail lim) ELSE MVB engine off delay lim AND MVB engine off fail lim Increment MVB engine off delay MV engine off delay Set Mode Valve B Engine Off Fault Pending	# LOW # NeutShf, NeutHi, Reverse < 295.00 = TRUE = TRUE # Diag Max Press > **Mode Valve B Eng Off Dly Lim** > **Mode Valve B Eng Off ML Lim** > MVB engine off delay lim	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) AND (hydraulic system pressure available OR auto stop active) GF9 engine off diagnsotic enable P18ACTest Fail This Key On P27EF Fault Active P27F1 Fault Active P27F2 Fault Active	= TRUE = FALSE = FALSE = TRUE = 1.00 = FALSE = FALSE = FALSE = FALSE	IF Mode Valve B Engine Off Fault Pending = TRUE Increment MVB engine off fail timer MVB engine off fail timer > MVB engine off fail lime update rate 6.25 milleseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control Valve B Stuck Off	P18AD	This diagnostic monitor detects a Mode Valve B Position Sensor State in the "off" or "low" state, which is in error, when hydraulic pressure in the circuit used to move the mode valve is sufficient to overcome the mode valve return spring force, leaving the mode valve mechanically in the “on” or “high” state. The diagnostic monitor also executes during transitions of the mode valve to verify Mode Valve B Position Sensor State changes correctly with mode valve state command.	Mode Valve B Position ETRS commanded direction AND mode valve B pressure IF (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail descritpion) IF (Mode Valve B Trnstn Fault Pending AND Mode Valve B St Fnl Fault Pending) MVB Fail Limit Increment MVB Fail Timer	# HIGH = Reverse, NeutHi, NeutShf > 295.00 = TRUE = FALSE = FALSE = **Mode Valve B Fail Lim**	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) ETRS commanded direction P18ACTest Fail This Key On P27EF Fault Active P27F1 Fault Active P27F2 Fault Active P18ADTest Fail This Key On P27F0 Test Fail This Key On IF (Mode Valve B Position OR Mode Valve B Position) Increment Steady State Delay Steady State Delay IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control)) Execute Fail	= TRUE = TRUE = ETRS diagnostic range = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE ≠ **Mode Valve B Final State** # Mode Valve B Command > **Mode Vlv StdySt Park Dly Lim** = PARK # PARK < 450.00 = Diag Min Press	MVB Fail Timer > MVB Fail Limit update rate 6.25 milleseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control)) Execute Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control) Execute Fail ELSE Increment Slip Delay Slip Delay Slip Detected (see mode valve slip detected definition) Execute Fail	= NeutLo = PARK < 450.00 = Diag Min Press = DRIVE || REVERSE = PARK > 450.00 # Diag Min Press > **ETRS Mode Valve B turbine delay** = Slip Detected		
			Mode Valve A Position IF (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail descritpion) IF (Mode Valve B Trnstn	# HIGH = TRUE = FALSE	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) Auto-Stop Active High Side Driver 1	= TRUE = TRUE = FALSE = TRUE	mode valve B fail count PARK > 2.00 counts mode valve B fail count OUT OF PARK > 2.00 counts update rate 6.25	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Fault Pending AND Mode Valve A St Fnl Fault Pending) MVB Fail Limit ELSE IF (Mode Valve B Trnstn Fault Pending) MVB Fail Limit ELSE IF (Mode Valve B St Fnl Fault Pending) MVB Fail Limit ELSE IF (High Side Driver 1 AND High Side Driver 2 AND Line pressure Command) MVB Fail Limit ELSE MVB Fail Limit Increment MVA Fail Timer	= FALSE = **Mode Valve B Fail Lim** = TRUE = ModeVlvB_TrnstnDly [ETRS diagnostic range][ETRS commanded direction] (see supporting tables for specific delay associated with each shift) = TRUE = ModeVlvB_FnlDly [ETRS diagnostic range][ETRS commanded direction] (see supporting tables for specific delay associated with each shift)ModeVlvlA_ = TRUE = TRUE # Diag Max Press = **Mode Valve B Eng Off Dly Lim** = **Mode Valve B Eng Off ML Lim**	High Side Driver 2 ETRS commanded direction ((Driver command P2812 Fault Active P2815 Fault Active P0970 Fault Active P2720 Fault Active) OR (Driver command P2814 Fault Active (P0968 Fault Active P0971 Fault Active) OR (P2718 Fault Active P2721 Fault Active))) Mode Enbl Vlv Stk On Test P18AFTest Fail This Key On IF ((((Mode Valve B St Attnd (see mode valve B st attnd description) AND Mode Valve B Trnstn (see mode valve B trnstn description))AND (Diagnostic Range OR Mode Valve A Trnstn (see mode valve A trnstn description) OR Mode Valve A St Attnd (see mode valve A st attnd description) OR (0 line pressure command AND Mode Valve B Position))) IF	= TRUE # ETRS diagnostic range = Park = FALSE = FALSE = FALSE = FALSE # Park = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = NeutShf = TRUE = TRUE = TRUE = HIGH	milleseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			IF (MVB Fail Timer IF (Mode Valve B Trnstn (see mode valve A trnstn description) Set Mode Valve B St Fnl Fault Pending) ELSE (Set Mode Valve B Trnstn Fault Pending)) Increment fail counter Set MVB Fail Timer = 0	> MVB Fail Limit = TRUE = TRUE = TRUE **ModeVlvB_TrnstnDly [ETRS attained range Drive, ETRS command range NeutHi]** **ModeVlvB_TrnstnDly [ETRS attained range Drive, ETRS command range NeutLo]** **ModeVlvB_TrnstnDly [ETRS attained range Drive, ETRS command range NeutShf]** **ModeVlvB_TrnstnDly [ETRS attained range Drive, ETRS command range Park]**	Diagnostic Enable AND Mode Valve B pressure command (ETRS Commanded Dirctn OR (ETRS Commanded Dirctn AND ETRS Diagnostic Range) Increment Delay Timer Delay Limit Delay Timer Set Mode Valve B sensor Fault Pending IF (Mode Valve B sensor Fault Pending AND (ETRS Commanded Dirctn AND (Park Servo Position OR 0 line pressure command)) Execute Mode Valve B Fail IF ((ETRS Commanded Dirctn AND ETRS Commanded Dirctn)	= 1.00 > 295.00 # Drive or Park = Park = Drive = ModeVlvB_TrnstnDly [ETRS diagnostic range] [ETRS commanded direction] (see supporting tables for specific delay associated with each shift) > Delay Limit = TRUE = TRUE = Park # PARK = TRUE # Drive or Park # Park		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvB_TrnstnDly [ETRS attained range Drive, ETRS command range Reverse] **ModeVlvB_TrnstnDly [ETRS attained range NeutLo, ETRS command range NeutHi]** **ModeVlvB_TrnstnDly [ETRS attained range NeutLo, ETRS command range NeutShf]** **ModeVlvB_TrnstnDly [ETRS attained range NeutLo, ETRS command range Reverse]** **ModeVlvB_TrnstnDly [ETRS attained range Park, ETRS command range NeutHi]** **ModeVlvB_TrnstnDly [ETRS attained range Park, ETRS command range NeutLo]** **ModeVlvB_TrnstnDly [ETRS attained range Park, ETRS command range NeutShf]** **ModeVlvB_TrnstnDly [ETRS attained range Park, ETRS command range Reverse]**	Execute Mode Valve B Fail IF (ETRS Diagnostic Range AND Park Servo Position Execute Mode Valve B Fail)) P18ACTest Fail This Key On P27EF Fault Active P27F1 Fault Active P27F2 Fault Active P18ADTest Fail This Key On P27F0 Test Fail This Key On	 = Park # OUT OF PARK = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				ModeVlvB_TrnstnDly [ETRS attained range NeutHi, ETRS command range NeutShf] ModeVlvB_TrnstnDly [ETRS attained range NeutHi, ETRS command range Reverse] ModeVlvB_TrnstnDly [ETRS attained range NeutShf, ETRS command range NeutHi] ModeVlvB_TrnstnDly [ETRS attained range NeutShf, ETRS command range Reverse] ModeVlvB_TrnstnDly [ETRS attained range Reverse, ETRS command range NeutShf]				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control Enable Valve Stuck On	P18AE	This diagnostic monitor detects the Mode Valve A Solenoid stuck in the hydraulic on state.	Mode valve position sensor A mode enable valve stuck on fail time increment fail counter	# Mode valve low >= **mode valve fail time**	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) Auto-Stop Active High Side Driver 1 High Side Driver 2 mode valve performance diagnostic monitor enable P18AETest Fail This Key On ETRS command direction ETRS range transmssion fluid tempertaure transmssion fluid tempertaure P2812 Fault Active P2815 Fault Active P0962 Fault Active P2738 Fault Active P0797 Fault Active P2715 Fault Active P18AA Fault Active P18AB Fault Active P27EC Fault Active P27EB Fault Active P27ED Fault Active P27EE Fault Active Mode Valve A init hi Mode Valve A sensor FP Mode Valve B sensor FP Mode Valve A Trnstn FP Mode Valve B Trnstn FP	= TRUE = TRUE = FALSE = TRUE = TRUE = 1.00 = FALSE = PARK = DRIVE > 0.00 °C < 255.99 °C = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE	mode enable valve fail count > 2 counts update rate 6.25 milleseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					IF Mode Valve A Command OR 0 line pressure command OR Test Delay Execute Mode Enable Valve Stuck On Test	 = LOW = TRUE > **Mode Enable Valve Test Delay Lim**		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Position Sensor/ Switch "A" Performance	P18E7	This diagnostic monitor detects park valve position sensor A performance faults, the sensor is indicating not park when command is park, or sensor does not transition when park is not commanded.	Park Position Sensor A P17FC fault active P17FA fault active P17FB fault active P18E7Test Fail This Key On Park positin sensor A FP IF (ETRS commanded direction AND ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) IF 0 Line Pressure Command Delay Limit ELSE Delay Limit) ELSE IF ((High Side Driver 1 High Side Driver 2 Line pressure control) Delay Limit ELSE	# Park Position Sensor B = FALSE = FALSE = FALSE = FALSE = FALSE = PARK = TRUE = TRUE > **Park Vlv Stk OffZL DLy Lim** > **Park Vlv Stk Off Dly Lim** = TRUE = TRUE # Diag Max Line > **Park Vlv Stk Off Eng Off Lim**	ETRS Performance Diag Enabl (see ETRS performance Diag Enabl description) High Side Driver 1 High Side Driver 2 diagnostic monitor enable IF (ETRS Commanded Dirctn Diagnostic Park State (see diagnostic park state definition) Park Servo Position IF ((ETRS Hydraulic Pressure Avail (see ETRS Hydraulic Pressure Avail description) OR (ETRS commanded direction AND PISA Fail Count (Mode Valve A position OR Mode Valve B position)) IF P17E7 fault active AND P17F5 fault active AND P17F6 fault active AND Park position sensor B FP AND P18E8Test Fail This Key On AND Park Position Sensor B) OR	= TRUE = TRUE = TRUE = 1.00 # Park = OUT OF PARK # OUT OF PARK = TRUE = NeutLo = 0 # LOW # LOW = FALSE = FALSE = FALSE = FALSE = FALSE = OUT OF PARK	Fail Count > 2.00 update rate 6.25 milleseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Delay Limit) ELSE Delay Limit Increment Delay Timer Delay Timer Increment Fail Timer Fail Timer Increment Fail Counter	> **Park Vlv Stk Off ML Eng Off Lim** > **Park Servo Stk On Delay Lim** > Delay Limit > 0.25	IF (ETRS Commanded Dirctn Diagnostic Park State (see diagnostic park state definition) Park Servo Position P17E7 fault active AND P17F5 fault active AND P17F6 fault active AND Park position sensor B FP AND P18E8Test Fail This Key On Park Position Sensor B AND Park Position Sensor A) Execute Park Position Sensor A Performance	# Park = PARK \# Park = FALSE = FALSE = FALSE = FALSE = FALSE = OUT OF PARK = PARK		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Park Valve Position Sensor/ Switch "B" Performance	P18E8	This diagnostic monitor detects park valve position sensor B performance faults, the sensor is indicating not park when command is park, or sensor does not transition when park is not commanded.	Park Position Sensor B P17FC fault active P17FA fault active P17FB fault active P18E7Test Fail This Key On Park positin sensor A FP IF (ETRS commanded direction AND ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) IF 0 Line Pressure Command Delay Limit ELSE Delay Limit) ELSE IF ((High Side Driver 1 High Side Driver 2 Line pressure control) Delay Limit	# Park Position Sensor A = FALSE = FALSE = FALSE = FALSE = FALSE = PARK = TRUE = TRUE > **Park Vlv Stk OffZL DLy Lim** > **Park Vlv Stk Off Dly Lim** = TRUE = TRUE # Diag Max Line >	ETRS Performance Diag Enabl (see ETRS performance Diag Enabl description) High Side Driver 1 High Side Driver 2 diagnostic monitor enable IF ((ETRS Commanded Dirctn Diagnostic Park State (see diagnostic park state definition) Park Servo Position IF (ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) OR (ETRS Hydraulic Pressure Avail AND Power Mode Prev to ACC)) P17FC fault active AND P17FA fault active AND P17FB fault active AND P18E7Test Fail This Key On AND Park positin sensor A FP AND Park Positin Sensor A) OR IF ((ETRS Commanded Dirctn AND	= TRUE = TRUE = TRUE = TRUE = 1.00 = Park = PARK # PARK = TRUE = FALSE # OFF = FALSE = FALSE = FALSE = FALSE = FALSE = Park = Park	Fail Count > 2.00 update rate 6.25 milleseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			ELSE Delay Limit) ELSE Delay Limit Increment Delay Timer Delay Timer Increment Fail Timer Fail Timer Increment Fail Counter	**Park Vlv Stk Off Eng Off Lim** >**Park Vlv Stk Off ML Eng Off Lim** >**Park Servo Stk On Delay Lim** > Delay Limit > 0.25	Diagnostic Park State (see diagnostic park state definition) AND Park Position Sensor A AND P17FC fault active AND P17FA fault active AND P17FB fault active AND P18E7Test Fail This Key On AND Park positin sensor A FP) OR IF ((ETRS Commanded Dirctn Diagnostic Park State (see diagnostic park state definition) Park Servo Position IF (ETRS commanded direction AND PISA Fail Count (Mode Valve A position OR Mode Valve B position)) IF (Park Position Sensor A AND P17FC fault active AND P17FA fault active AND P17FB fault active AND P18E7Test Fail This Key On AND Park positin sensor A FP)) Execute Park Position Sensor B Performance	= OUT OF PARK = PARK = FALSE = FALSE = FALSE = FALSE = FALSE # Park = OUT OF PARK # OUT OF PARK = NeutLo = 0 # LOW # LOW = OUT OF PARK = FALSE = FALSE = FALSE = FALSE =FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Actuator Supply Voltage B Circuit Low	P2670	Controller specific output driver circuit diagnoses the high sided driver circuit for a short to ground failure, or where controller H/W cannot differentiate, diagnoses the high sided driver circuit for a short to ground failure or open circuit failure, when the output is powered on, by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range during driver on state indicates short to ground failure. Controller specific output driver circuit voltage thresholds are set to meet the following controller specification for a short to ground or an open circuit.	< 0.5 0 impedance between signal and controller ground OR > 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail count and increment sample count, otherwise increment only sample count	(ground short diagnostic monitor enable calibration OR open circuit diagnostic monitor enable calibration) high side drive 2 ON service mode $04 active	= 1 Boolean = 1 Boolean = TRUE = FALSE	ground short fail count > 6 counts within sample count of 2,400 counts OR open circuit fail count > 6 counts within sample count of 2,400 counts 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid D Stuck On	P2715	Each pressure control solenoid stuck on diagnostic monitor detects a clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional. The clutch pressure control solenoid is tested during an automatic transmission shift by monitoring the off going clutch slip speed. With the clutch pressure control solenoid failed on, still allowing hydraulic pressure to the clutch being commanded off, the intended off going clutch continues to maintain torque capacity during the transmission automatic shift. In the failure mode, the off going clutch slip speed will remain near zero RPM when the clutch pressure control solenoid is commanded to an off pressure in the normal operation to release the holding clutch. The clutch slip speed is calculated based on the transmission lever node design, requiring	shift type is power down shift: C4 clutch slip speed OR shift type is garage shift: C4 clutch slip speed ELSE shift is another type: C4 clutch slip speed update fail time 6.25 milliscond update	 < 50.00 RPM < 100.00 RPM < 50.00 RPM			Base fail time: shift type is power down shift: fail time > 0.80 seconds shift type is garage shift: fail time > 0.25 shift type is another type: fail time >0.15 seconds Add fail time offset according to shift type: open throttle upshift: **Clutch Stuck On Fail Offset Time PU Shifts** open throttle downshift: **Clutch Stuck On Fail Offset Time PD Shifts** garage shift: **Clutch Stuck On Fail Offset Time GS Shifts** closed throttle downshift:	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. As part of the pressure control solenoid stuck on diagnostic monitor, the safety startle mitigation function executes when in steady state gear, no automatic transmission shift in progress. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed hydraulically on, while the solenoid is electrically functional. All clutch pressure control solenoid stuck on diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck on test			**********	**********	**Clutch Stuck On Fail Offset Time CD Shifts** negative torque upshift: **Clutch Stuck On Fail Offset Time NU Shifts** clutch staging shift: **Clutch Stuck On Fail Offset Time STGR Shifts** update fail count, fail count > 3 counts 6.25 milliscond update	
					system-level enables: use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage) use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage)	= 1 Boolean = 1 Boolean > 9.00 volts = 1 Boolean = 1 Boolean > 9.00 volts	battery voltage time > 0.100 seconds run crank voltage time > 0.100	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		is disabled. This diagnostic monitor is relative to GF9 C4 clutch pressure control solenoid.			TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean	seconds	
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning procedure active	= FALSE Boolean		
					hydraulic pressure available	= TRUE		
					(hydraulic pressure OR Park/Neutral Stuck on FP OR Neutral Staging Line Pressure Disable) **********	> -999 kPa =TRUE =TRUE **********		
					range shift state	# range shift complete		
					diagnostic clutch test	= OFF GOING CLUTCH TEST		
					transmission output shaft speed	> 89.0 RPM		
					((C4 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable)	= TRUE = 1 (1 to enable, 0 to disable)	exhaust delay by	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR C4 off going clutch command pressure)	 < 113 kPa	shift type: closed throttle upshift: **C4 exhaust delay closed throttle lift foot up shift** open throttle upshift: **C4 exhaust delay open throttle power on up shift** garage shifts: **C4 exhaust delay garage shift** closed throttle downshift: **C4 exhaust delay closed throttle down shift** negative torque upshift: **C4 exhaust delay negative torque up shift** open throttle downshift: **C4 exhaust delay open throttle power down shift**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(engine torque AND Primary oncoming stuck on torque enable cal) OR (primary oncoming clutch active primary on coming control state primary on coming commanded pressure)	> 8,192 Nm = 0 (0 is enable, 1 is enable) = TRUE # clutch fill phase > pressure clip threshold according to shift type: closed/open throttle upshifts dependent on oncoming clutch: **C1 Powered Upshift Tq Based Pres Clip** OR **C2 Powered Upshift Tq Based Pres Clip** OR **C3 Powered Upshift Tq Based Pres Clip** OR **C5 Powered Upshift Tq Based Pres Clip** OR **C6 Powered Upshift Tq Based Pres Clio**	Post-torque phase delay for powered upshifts is dependent on the oncoming clutch: **C1_Oncoming Post-Torque Phase Delay** OR **C2_Oncoming Post-Torque Phase Delay** OR **C3_Oncoming Post-Torque Phase Delay** OR **C5_Oncoming Post-Torque Phase Delay** OR **C6_Oncoming Post-Torque Phase Delay**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						coasting downshift dependent on oncoming clutch: **C1 Coasting Downshift Tq Based Pres Clip** OR **C2 Coasting Downshift Tq Based Pres Clip** OR **C3 Coasting Downshift Tq Based Pres Clip** OR **C5 Coasting Downshift Tq Based Pres Clip** OR **C6 Coasting Downshift Tq Based Pres Clip** clip thresholds for all other shift types: garage shifts: **Clutch Clip Press GS Shifts** negative torque upshift: **Clutch Clip Press NU Shifts** open throttle downshift: **Clutch Clip Press PD Shifts**		
					C4 clutch slip speed valid, all speed sensors are functional for lever node clucth slio soeed	= TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					calculation ********** conditions needed to trigger test: (current shift type AND shift type enable cal for current shift type) OR (Intrusive shift active AND shift type enable cal for garage shift AND Attained Gear AND (stuck on enable cal for forward garge shifts AND driver requested direction AND commanded gear) OR (stuck on enable cal for reverse garage shifts AND driver requested direction AND commanded gear)) clutch stuck off intrusive shift active startle mitigation active (see note on startle mitigation below) (new clutch controller has	********** # Garage shift **Clutch Stuck On Shift = Type Enable** (0 table value will disable, 1 will enable) = FALSE = 0 (0 will enable, 1 will enable) = NEUTRAL OR commanded gear = 0 (0 to disable, 1 to enable) = FORWARD = a FORWARD gear = 0 (0 to disable, 1 to enable) = REVERSE = REVERSE = FALSE = FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					been initalized OR transitioning to a different clutch controller)	= TRUE = TRUE		
					current clutch solenoid test state	transitions to TestState or TUT_HOLD (see note below about state transitions)		
					**********	**********		
					DTCs not fault pending	P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6		
					DTCs not fault active	P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					********** NOTE: Clutch control solenoid test state TIE UP TEST HOLD is necessary, as it is possible to have multiple off going clutches during one automatic transmission shift. Clutch control solenoid test state is set to TIE UP TEST HOLD during an automatic transmission shift due to two conditions: Current value of clutch control solenoid test state is TIE UP TEST TEST STATE, when one off going clutch pressure control solenoid stuck on diagnostic monitor is currently executing. AND That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed > clutch slip speed fail threshold. Once clutch control solenoid test state is set to TIE UP TEST HOLD, it remains TIE UP TEST HOLD durinq the	P2821 P2820 P178F P17C6 P17C4 P17C7 P172AP172B **********		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					automatic transmission shift, until: An additional off going clutch occurs, as indicated by solenoid stuck on test trigger = TRUE, subsequently clutch control solenoid test state is reset to TIE UP TEST TEST STATE, to allow the additional corresponding off going clutch pressure control solenoid stuck on diagnostic monitor to execute. OR The automatic transmission shift completes, range shift state = range shift complete. NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control solenoid stuck on failure mode that occurs during steady state gear, not during an automatic transmission shift. The startle mitigation active then forces the transmission clutch pressure control system to a safe gear or neutral state, based on the active and inactive clutches, when the unintended			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					vehicle deceleration occurred. Once a safe vehicle gear state is attained, the gear and clutch pressure control system allows transitions of the clutches on and off, to sequence automatic transmission shifts, single step shifts. As each single step automatic transmission shift occurs the normal pressure control solenoid stuck on diagnostic monitors execute to verify which clutch pressure control solenoid is in the stuck on failure mode, allowing one of the clutch pressure control solenoid stuck on DTCstoset P0747, P0777, P0797, P2715, P2724, P2733, P2821.			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid D Control Circuit Open	P2718	Controller specific circuit diagnoses 9 speed C4, 10 speed C23467810R, 8 speed C23468 clutch, or CVT input clutch solenoid for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit	> 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid D Control Circuit Low	P2720	Controller specific circuit diagnoses 9 speed C4, 10 speed C23467810R, 8 speed C23468 clutch, or CVT input clutch, solenoid for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid D Control Circuit High	P2721	Controller specific circuit diagnoses 9 speed C4, 10 speed C23467810R, 8 speed C23468 clutch, or CVT input clutch, solenoid for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage	< 0.5 0 impedance between signal and controller voltage source When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid E Stuck Off	P2723	Each pressure control solenoid stuck off diagnostic monitor detects a clutch pressure control solenoid failed hydraulically off, while the solenoid is electrically functional. In the failure mode the clutch slip speed, and gear box gear slip, will be excessive, not near or at zero RPM. The clutch slip speed is calculated based on the transmission lever node design, requiring transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. The clutch pressure control solenoid is tested after an automatic transmission shift occurs and has been considered shift complete, or, steady state gear is deemed active, range shift complete. When the automatic transmission shift is complete, steady state gear is considered, the clutch pressure control solenoid is mapped to transmission line	C5 clutch slip speed, update fail time 6.25 milliscond update	> 200.0 RPM	**********	**********	fail time > 1.00 seconds, update fail count, fail count > 2 counts 6.25 milliscond update	Type A, 1 Trips
					system-level enables:			
					use battery voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use battery voltage calibration is TRUE	= 1 Boolean		
					AND			
					battery voltage)	> 9.00 volts	battery voltage time > 0.100 seconds	
					use run crank voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use run crank voltage calibration is TRUE	= 1 Boolean		
					AND			
					run crank voltage)	> 9.00 volts	run crank voltage time > 0.100 seconds	
					TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		pressure control, which normally allows the clutch to maintain full torque holding capacity at the given engine crankshaft torque, to maintain true gear ratio. When the clutch pressure control solenoid is failed hydraulically off, the clutch does not maintain holding capacity at any engine crankshaft torque, and the clutch slip speed is uncontrollable. The clutch pressure control solenoid test is suspended if the higher level safety startle mitigation function is active. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed in the opposite sense, clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional, which must take priority over any clutch pressure control solenoid stuck off diagnostic monitor. All clutch pressure control			procedure active hydraulic pressure available (hydraulic pressure OR Clutch Stuck on in Park/ Neutral fault pending OR Neutral Staging Line Pressure Disable) ********** enable C5 clutch slip speed fail compare when: ((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) unintended deceleration fault pending OR unintended deceleration fault pending enable cal is FALSE (startle mitigation) clutch steady state adaptive active (transmission output shaft speed OR accelerator pedal position	= FALSE Boolean = TRUE > -999.00 kPa = TRUE = TRUE ********** = FALSE = TRUE # initial startle mitigation gear = FALSE = 0 (0 to enable, 1 to disable) = FALSE > 89.0 RPM > 2.00 %		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		solenoid stuck on/off diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck off test is disabled. This diagnostic monitor is relative to C5 (GF9 C57R) clutch pressure control solenoid.			OR engine speed OR transmission input shaft speed) C5 clutch slip speed valid C5 clutch pressured map (enable forward gear cal AND driver direction request AND Attained Gear) OR (enable reverse gear cal AND driver direction request AND Attained Gear) range shift state ********** DTCs not fault pending DTCs not fault active	> 1,500.0 RPM > 450.0 RPM = TRUE (all speed sensors are functional for lever node clutch slip speed calculation) = mapped to line pressure, C5 clutch pressure has reached fully applied state = 1 (1 to enable, 0 to disable) = FORWARD = a FORWARD gear = 0 (1 to enable, 0 to disable) = REVERSE = REVERSE = range shift complete ********** P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6 P2534 P0707 P0708 P0716 P0717 P07C0	> 1.000 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P178F P17C6 P17C4 P17C7 P172A P172B		
					NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715P2724 P2733 P2821			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid E Stuck On	P2724	Each pressure control solenoid stuck on diagnostic monitor detects a clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional. The clutch pressure control solenoid is tested during an automatic transmission shift by monitoring the off going clutch slip speed. With the clutch pressure control solenoid failed on, still allowing hydraulic pressure to the clutch being commanded off, the intended off going clutch continues to maintain torque capacity during the transmission automatic shift. In the failure mode, the off going clutch slip speed will remain near zero RPM when the clutch pressure control solenoid is commanded to an off pressure in the normal operation to release the holding clutch. The clutch slip speed is calculated based on the transmission lever node design, requiring	shift type is power down shift: C5 clutch slip speed OR shift type is garage shift: C5 clutch slip speed ELSE shift is another type: C5 clutch slip speed update fail time 6.25 milliscond update	 < 50.00 RPM < 100.00 RPM < 50.00 RPM			Base fail time: shift type is power down shift: fail time > 0.40 seconds shift type is garage shift: fail time > 0.25 shift type is another type: fail time >0.15 seconds Add fail time offset according to shift type: open throttle upshift: **Clutch Stuck On Fail Offset Time PU Shifts** open throttle downshift: **Clutch Stuck On Fail Offset Time PD Shifts** garage shift: **Clutch Stuck On Fail Offset Time GS Shifts** closed throttle downshift:	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. As part of the pressure control solenoid stuck on diagnostic monitor, the safety startle mitigation function executes when in steady state gear, no automatic transmission shift in progress. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed hydraulically on, while the solenoid is electrically functional. All clutch pressure control solenoid stuck on diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck on test			**********	**********	**Clutch Stuck On Fail Offset Time CD Shifts** negative torque upshift: **Clutch Stuck On Fail Offset Time NU Shifts** clutch staging shift: **Clutch Stuck On Fail Offset Time STGR Shifts** update fail count, fail count > 3 counts 6.25 milliscond update	
					system-level enables: use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage) use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage)	= 1 Boolean = 1 Boolean > 9.00 volts = 1 Boolean = 1 Boolean > 9.00 volts	battery voltage time > 0.100 seconds run crank voltage time > 0.100	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		is disabled. This diagnostic monitor is relative to the GF9 C5 C57R clutch pressure control solenoid.			TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean	seconds	
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning procedure active	= FALSE Boolean		
					hydraulic pressure available	= TRUE		
					(hydraulic pressure OR Park/Neutral Stuck on FP OR Neutral Staging Line Pressure Disable)	> -999 kPa =TRUE =TRUE		
					**********	**********		
					range shift state	# range shift complete		
					diagnostic clutch test	= OFF GOING CLUTCH TEST		
					transmission output shaft speed	> 89.0 RPM		
					((C5 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable)	= TRUE = 1 (1 to enable, 0 to disable)	exhaust delay by	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR C5 off going clutch command pressure)	 < 145 kPa	shift type: closed throttle upshift: **C5 exhaust delay closed throttle lift foot up shift** open throttle upshift: **C5 exhaust delay open throttle power on up shift** garage shifts: **C5 exhaust delay garage shift** closed throttle downshift: **C5 exhaust delay closed throttle down shift** negative torque upshift: **C5 exhaust delay negative torque up shift** open throttle downshift: **C5 exhaust delay open throttle power down shift**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(engine torque AND Primary oncoming stuck on torque enable cal) OR (primary oncoming clutch active primary on coming control state primary on coming commanded pressure)	> 8,192 Nm = 0 (0 is enable, 1 is enable) = TRUE # clutch fill phase > pressure clip threshold according to shift type: closed/open throttle upshifts dependent on oncoming clutch: **C1 Powered Upshift Tq Based Pres Clip** OR **C2 Powered Upshift Tq Based Pres Clip** OR **C3 Powered Upshift Tq Based Pres Clip** OR **C4 Powered Upshift Tq Based Pres Clip** OR **C6 Powered Upshift Tq Based Pres Clip** coastina downshift	Post-torque phase delay for powered upshifts is dependent on the oncoming clutch: **C1_Oncoming Post-Torque Phase Delay** OR **C2_Oncoming Post-Torque Phase Delay** OR **C3_Oncoming Post-Torque Phase Delay** OR **C4_Oncoming Post-Torque Phase Delay** OR **C6_Oncoming Post-Torque Phase Delay**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						dependent on oncoming clutch: **C1 Coasting Downshift Tq Based Pres Clip** OR **C2 Coasting Downshift Tq Based Pres Clip** OR **C3 Coasting Downshift Tq Based Pres Clip** OR **C4 Coasting Downshift Tq Based Pres Clip** OR **C6 Coasting Downshift Tq Based Pres Clip** clip thresholds for all other shift types: garage shifts: **Clutch Clip Press GS Shifts** negative torque upshift: **Clutch Clip Press NU Shifts** open throttle downshift: **Clutch Clip Press PD Shifts**		
					C5 clutch slip speed valid, all speed sensors are functional for lever node clucth slip speed calculation	= TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					**********	**********		
					conditions needed to trigger test:			
					(current shift type	# Garage shift		
					AND			
					shift type enable cal for current shift type)	**Clutch Stuck On Shift = Type Enable** (0 table value will disable, 1 will enable)		
					OR			
					(Intrusive shift active	= FALSE		
					AND			
					shift type enable cal for garage shift	= 0 (0 will enable, 1 will enable)		
					AND			
					Attained Gear	= NEUTRAL OR commanded gear		
					AND			
					(stuck on enable cal for forward garge shifts	= 0 (0 to disable, 1 to enable)		
					AND			
					driver requested direction	= FORWARD		
					AND			
					commanded gear)	= a FORWARD gear		
					OR			
					(stuck on enable cal for reverse garage shifts	= 0 (0 to disable, 1 to enable)		
					AND			
					driver requested direction	= REVERSE		
					AND			
					commanded gear))	= REVERSE		
					clutch stuck off intrusive shift active	= FALSE		
					startle mitigation active (see note on startle mitigation below)	= FALSE		
					(new clutch controller has been initalized	= TRUE		
					OR			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					transitioning to a different clutch controller)	= TRUE		
					current clutch solenoid test state	transitions to TestState or TUT_HOLD (see note below about state transitions)		
					**********	**********		
					DTCs not fault pending	P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6		
					DTCs not fault active	P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P2820 P178F P17C6 P17C4 P17C7		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					**********	P172AP172B **********		
					NOTE: Clutch control solenoid test state TIE UP TEST HOLD is necessary, as it is possible to have multiple off going clutches during one automatic transmission shift. Clutch control solenoid test state is set to TIE UP TEST HOLD during an automatic transmission shift due to two conditions: Current value of clutch control solenoid test state is TIE UP TEST TEST STATE, when one off going clutch pressure control solenoid stuck on diagnostic monitor is currently executing. AND That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed > clutch slip speed fail threshold. Once clutch control solenoid test state is set to TIE UP TEST HOLD, it remains TIE UP TEST HOLD during the automatic transmission shift, until:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					An additional off going clutch occurs, as indicated by solenoid stuck on test trigger = TRUE, subsequently clutch control solenoid test state is reset to TIE UP TEST TEST STATE, to allow the additional corresponding off going clutch pressure control solenoid stuck on diagnostic monitor to execute. OR The automatic transmission shift completes, range shift state = range shift complete. NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control solenoid stuck on failure mode that occurs during steady state gear, not during an automatic transmission shift. The startle mitigation active then forces the transmission clutch pressure control system to a safe gear or neutral state, based on the active and inactive clutches, when the unintended vehicle deceleration occurred. Once a safe			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					vehicle gear state is attained, the gear and clutch pressure control system allows transitions of the clutches on and off, to sequence automatic transmission shifts, single step shifts. As each single step automatic transmission shift occurs the normal pressure control solenoid stuck on diagnostic monitors execute to verify which clutch pressure control solenoid is in the stuck on failure mode, allowing one of the clutch pressure control solenoid stuck on DTCstoset P0747, P0777, P0797, P2715, P2724, P2733, P2821.			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid E Control Circuit Open	P2727	Controller specific circuit diagnoses 9 speed C57R, 10 speed C1356789, 8 speed C45678R clutch solenoid, or CVTTCC Control solenoid for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit	> 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid E Control Circuit Low	P2729	Controller specific circuit diagnoses 9 speed C57R, 10 speed C1356789, 8 speed C45678R clutch, or CVT TCC Control solenoid for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid E Control Circuit High	P2730	Controller specific circuit diagnoses 9 speed C57R, 10 speed C1356789, 8 speed C45678R, or CVT TCC Control solenoid for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage	< 0.5 0 impedance between signal and controller voltage source When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid F Stuck On	P2731	Each pressure control solenoid stuck on diagnostic monitor detects a clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional. The clutch pressure control solenoid is tested during an automatic transmission shift by monitoring the off going clutch slip speed. With the clutch pressure control solenoid failed on, still allowing hydraulic pressure to the clutch being commanded off, the intended off going clutch continues to maintain torque capacity during the transmission automatic shift. In the failure mode, the off going clutch slip speed will remain near zero RPM when the clutch pressure control solenoid is commanded to an off pressure in the normal operation to release the holding clutch. The clutch slip speed is calculated based on the transmission lever node design, requiring transmission input shaft	shift type is power down shift: C6 clutch slip speed OR shift type is garage shift: C6 clutch slip speed ELSE shift is another type: C6 clutch slip speed update fail time 6.25 milliscond update Attained Gear OR Attained Gear	 < 50.00 RPM < 100.00 RPM < 50.00 RPM = First Lock = First Freewheel			Base fail time: shift type is power down shift: fail time > 0.80 seconds shift type is garage shift: fail time > 0.25 shift type is another type: fail time >0.15 seconds Add fail time offset according to shift type: open throttle upshift: **Clutch Stuck On Fail Offset Time PU Shifts** open throttle downshift: **Clutch Stuck On Fail Offset Time PD Shifts** garage shift: **Clutch Stuck On Fail Offset Time GS Shifts** closed throttle downshift:	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		speed, transmission output shaft speed, and, one transmission intermediate shaft speed. As part of the pressure control solenoid stuck on diagnostic monitor, the safety startle mitigation function executes when in steady state gear, no automatic transmission shift in progress. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed hydraulically on, while the solenoid is electrically functional. All clutch pressure control solenoid stuck on diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the a clutch pressure control solenoid stuck on test is disabled. This			**********	**********	**Clutch Stuck On Fail Offset Time CD Shifts** negative torque upshift: **Clutch Stuck On Fail Offset Time NU Shifts** clutch staging shift: **Clutch Stuck On Fail Offset Time STGR Shifts** update fail count, fail count > 3 counts 6.25 milliscond update	
					system-level enables: use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage)	= 1 Boolean = 1 Boolean > 9.00 volts		
					use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage)	= 1 Boolean = 1 Boolean > 9.00 volts	battery voltage time > 0.100 seconds	
					TCM output driver high side driver 1, clutch pressure control solenoid	= TRUE Boolean	run crank voltage time > 0.100 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		diagnostic monitor is relative to the GF9 C6 C6789/Selectable One Way Clutch (SOWC) CBR1,or, GR10C6 C45678910R, clutch pressure control solenoid.			driver circuit enabled TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled service fast learn active service solenoid cleaning procedure active hydraulic pressure available (hydraulic pressure OR Park/Neutral Stuck on FP OR Neutral Staging Line Pressure Disable) ********** range shift state diagnostic clutch test transmission output shaft speed ((C6 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable) OR C6 off going clutch	= TRUE Boolean = FALSE Boolean = FALSE Boolean = TRUE > -999 kPa =TRUE =TRUE ********** # range shift complete = OFF GOING CLUTCH TEST > 89.0 RPM = TRUE = 1 (1 to enable, 0 to disable)		exhaust delay by	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					command pressure)	< 235 kPa	shift type: closed throttle upshift: **C6 exhaust delay closed throttle lift foot up shift** open throttle upshift: **C6 exhaust delay open throttle power on up shift** garage shifts: **C6 exhaust delay garage shift** closed throttle downshift: **C6 exhaust delay garage shift** negative torque upshift: **C6 exhaust delay negative torque up shift** open throttle downshift: **C6 exhaust delay open throttle power down shift**	
					(engine torque AND Primary oncoming stuck on torque enable cal) OR	> 8,192 Nm = 0 (0 is enable, 1 is enable)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					(primary oncoming clutch active primary on coming control state primary on coming commanded pressure)	= TRUE # clutch fill phase > pressure clip threshold according to shift type: closed/open throttle upshifts dependent on oncoming clutch: **C1 Powered Upshift Tq Based Pres Clip** OR **C2 Powered Upshift Tq Based Pres Clip** OR **C3 Powered Upshift Tq Based Pres Clip** OR **C4 Powered Upshift Tq Based Pres Clip** OR **C5 Powered Upshift Tq Based Pres Clip** coasting downshift dependent on oncoming clutch: **C1 Coasting Downshift Tq Based Pres Clip** OR **C2 Coasting Downshift Ta Based Pres Clio**	Post-torque phase delay for powered upshifts is dependent on the oncoming clutch: **C1_Oncoming Post-Torque Phase Delay** OR **C2_Oncoming Post-Torque Phase Delay** OR **C3_Oncoming Post-Torque Phase Delay** OR **C4_Oncoming Post-Torque Phase Delay** OR **C5_Oncoming Post-Torque Phase Delay**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						OR **C3 Coasting Downshift Tq Based Pres Clip** OR **C4 Coasting Downshift Tq Based Pres Clip** OR **C5 Coasting Downshift Tq Based Pres Clip** clip thresholds for all other shift types: garage shifts: **Clutch Clip Press GS Shifts** negative torque upshift: **Clutch Clip Press NU Shifts** open throttle downshift: **Clutch Clip Press PD Shifts**		
					C6 clutch slip speed valid, all speed sensors are functional for lever node clucth slip speed calculation ********** conditions needed to trigger test: (current shift type AND shift type enable cal for current shift type)	= TRUE ********** # Garage shift **Clutch Stuck On Shift = Type Enable** (0 table value will disable.		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR	1 will enable)		
					(Intrusive shift active	= FALSE		
					AND			
					shift type enable cal for garage shift	= 0 (0 will enable, 1 will enable)		
					AND			
					Attained Gear	= NEUTRAL OR commanded gear		
					AND			
					(stuck on enable cal for forward garge shifts	= 0 (0 to disable, 1 to enable)		
					AND			
					driver requested direction	= FORWARD		
					AND			
					commanded gear)	= a FORWARD gear		
					OR			
					(stuck on enable cal for reverse garage shifts	= 0 (0 to disable, 1 to enable)		
					AND			
					driver requested direction	= REVERSE		
					AND			
					commanded gear))	= REVERSE		
					clutch stuck off intrusive shift active	= FALSE		
					startle mitigation active (see note on startle mitigation below)	= FALSE		
					(new clutch controller has been initalized	= TRUE		
					OR			
					transitioning to a different clutch controller)	= TRUE		
					current clutch solenoid test state	transitions to TestState or TUT_HOLD (see note below about state transitions)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					**********	**********		
					DTCs not fault pending	P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6		
					DTCs not fault active	P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P2820 P178F P17C6 P17C4 P17C7 P172AP172B		
					**********	**********		
					NOTE: Clutch control solenoid test state TIE UP TEST HOLD is necessary, as it is possible to have			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					multiple off going clutches during one automatic transmission shift. Clutch control solenoid test state is set to TIE UP TEST HOLD during an automatic transmission shift due to two conditions: Current value of clutch control solenoid test state is TIE UP TEST TEST STATE, when one off going clutch pressure control solenoid stuck on diagnostic monitor is currently executing. AND That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed > clutch slip speed fail threshold. Once clutch control solenoid test state is set to TIE UP TEST HOLD, it remains TIE UP TEST HOLD during the automatic transmission shift, until: An additional off going clutch occurs, as indicated by solenoid stuck on test trigger = TRUE, subsequently clutch control solenoid test state is reset to TIE UP TEST TEST STATE, to allow the additional			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					corresponding off going clutch pressure control solenoid stuck on diagnostic monitor to execute. OR The automatic transmission shift completes, range shift state = range shift complete. NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control solenoid stuck on failure mode that occurs during steady state gear, not during an automatic transmission shift. The startle mitigation active then forces the transmission clutch pressure control system to a safe gear or neutral state, based on the active and inactive clutches, when the unintended vehicle deceleration occurred. Once a safe vehicle gear state is attained, the gear and clutch pressure control system allows transitions of the clutches on and off, to sequence automatic transmission shifts, single step shifts. As each single step automatic			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					transmission shift occurs the normal pressure control solenoid stuck on diagnostic monitors execute to verify which clutch pressure control solenoid is in the stuck on failure mode, allowing one of the clutch pressure control solenoid stuck on DTCstoset P0747, P0777, P0797, P2715, P2724, P2733, P2821.			
			Intrusive Neutral Event Timer AND C6 Fail counter has already achieved 1 fail count (as determined from previous C6 pressure control solenoid stuck on logic)	> 5 counts	Previous Binary clutch control abort reason Binary clutch Neutral release time Active Clutch Controller Binary Clutch control state Vehicle speed source: Wheel speed sensors present (Wheel speed error OR Neutral release state timer)	= No Abort **Binary Clutch Neutral > Release Time Out** = Garage Shift = SOWC Release # Trans Output Speed AND # Average Driven wheel AND # Single Driven wheel AND # Trans Internal Speed # Non Driven = TRUE **Binary Clutch C1 Neutral Release Time > Out**		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Clutch 1 percent filled OR (Clutch slip source AND Clutch 1 slip speed AND Selected Range) Attained Gear Direction OR Cmnd Gear Direction OR Attained Gear OR Scheduled Gear OR (Transmission Oil Temp Sensor FA AND Trans Oil Temp) ********** The following DTCs not FA or FP: P176B, P176C, P176D	< 1.00 % # NO SOURCE AVAILABLE **Binary Clutch C1 Slip > Threshold** # PARK, REVERSE, Or NEUTRAL # Forward # Forward # 1st Lock <br< 1st Lock = FALSE **Binary Clutch Cold > Inhibit Thresh** **********	**Binary Clutch C1 FEM Neutral Release Thresh**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid F Stuck Off	P2732	Each pressure control solenoid stuck off diagnostic monitor detects a clutch pressure control solenoid failed hydraulically off, while the solenoid is electrically functional. In the failure mode the clutch slip speed, and gear box gear slip, will be excessive, not near or at zero RPM. The clutch slip speed is calculated based on the transmission lever node design, requiring transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. The clutch pressure control solenoid is tested after an automatic transmission shift occurs and has been considered shift complete, or, steady state gear is deemed active, range shift complete. When the automatic transmission shift is complete, steady state gear is considered, the clutch pressure control solenoid is mapped to transmission line	C6 clutch slip speed, update fail time 6.25 milliscond update	> 200.0 RPM	**********	**********	fail time > 1.00 seconds, update fail count, fail count > 2 counts 6.25 milliscond update	Type A, 1 Trips
					system-level enables:			
					use battery voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use battery voltage calibration is TRUE	= 1 Boolean		
					AND			
					battery voltage)	> 9.00 volts	battery voltage time > 0.100 seconds	
					use run crank voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use run crank voltage calibration is TRUE	= 1 Boolean		
					AND			
					run crank voltage)	> 9.00 volts	run crank voltage time > 0.100 seconds	
					TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		pressure control, which normally allows the clutch to maintain full torque holding capacity at the given engine crankshaft torque, to maintain true gear ratio. When the clutch pressure control solenoid is failed hydraulically off, the clutch does not maintain holding capacity at any engine crankshaft torque, and the clutch slip speed is uncontrollable. The clutch pressure control solenoid test is suspended if the higher level safety startle mitigation function is active. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed in the opposite sense, clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional, which must take priority over any clutch pressure control solenoid stuck off diagnostic monitor. All clutch pressure control			procedure active hydraulic pressure available (hydraulic pressure OR Clutch Stuck on in Park/ Neutral fault pending OR Neutral Staging Line Pressure Disable) ********** enable C6 clutch slip speed fail compare when: ((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) unintended deceleration fault pending OR unintended deceleration fault pending enable cal is FALSE (startle mitigation) clutch steady state adaptive active (transmission output shaft speed OR accelerator pedal position OR	= FALSE Boolean = TRUE > -999.00 kPa = TRUE = TRUE ********** = FALSE = TRUE # initial startle mitigation gear = FALSE = 0 (0 to enable, 1 to disable) = FALSE > 89.0 RPM > 2.00 %		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		solenoid stuck on/off diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck off test is disabled. This diagnostic monitor is relative to C6 (GF9 C6789/SOWC) clutch pressure control solenoid.			engine speed OR transmission input shaft speed) C6 clutch slip speed valid C6 clutch pressured map (enable forward gear cal AND driver direction request AND Attained Gear) OR (enable reverse gear cal AND driver direction request AND Attained Gear) range shift state ********** DTCs not fault pending DTCs not fault active	> 1,500.0 RPM > 450.0 RPM = TRUE (all speed sensors are functional for lever node clutch slip speed calculation) = mapped to line pressure, C6 clutch pressure has reached fully applied state = 1 (1 to enable, 0 to disable) = FORWARD = a FORWARD gear = 0 (1 to enable, 0 to disable) = REVERSE = REVERSE = range shift complete ********** P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6 P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C	> 1.000 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P178F P17C6 P17C4 P17C7 P172A P172B		
					NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715P2724 P2733 P2821			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid F Stuck On (GF9)	P2733	Each pressure control solenoid stuck on diagnostic monitor detects a clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional. The clutch pressure control solenoid is tested during an automatic transmission shift by monitoring the off going clutch slip speed. With the clutch pressure control solenoid failed on, still allowing hydraulic pressure to the clutch being commanded off, the intended off going clutch continues to maintain torque capacity during the transmission automatic shift. In the failure mode, the off going clutch slip speed will remain near zero RPM when the clutch pressure control solenoid is commanded to an off pressure in the normal operation to release the holding clutch. The clutch slip speed is calculated based on the transmission lever node design, requiring	shift type is power down shift: C6 clutch slip speed OR shift type is garage shift: C6 clutch slip speed ELSE shift is another type: C6 clutch slip speed update fail time 6.25 milliscond update	 < 50.00 RPM < 100.00 RPM < 50.00 RPM				Base fail time: shift type is power down shift: fail time > 0.80 seconds shift type is garage shift: fail time > 0.25 shift type is another type: fail time >0.15 seconds Add fail time offset according to shift type: open throttle upshift: **Clutch Stuck On Fail Offset Time PU Shifts** open throttle downshift: **Clutch Stuck On Fail Offset Time PD Shifts** garage shift: **Clutch Stuck On Fail Offset Time GS Shifts** closed throttle downshift:	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. As part of the pressure control solenoid stuck on diagnostic monitor, the safety startle mitigation function executes when in steady state gear, no automatic transmission shift in progress. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed hydraulically on, while the solenoid is electrically functional. All clutch pressure control solenoid stuck on diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the clutch pressure control solenoid stuck on test			**********	**********	**Clutch Stuck On Fail Offset Time CD Shifts** negative torque upshift: **Clutch Clip Press NU Shifts** clutch staging shift: **Clutch Stuck On Fail Offset Time STGR Shifts** update fail count, fail count > 3 counts 6.25 milliscond update	
					system-level enables: use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage)	= 1 Boolean = 1 Boolean > 9.00 volts	battery voltage time > 0.100 seconds	
					use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage)	= 1 Boolean = 1 Boolean > 9.00 volts	run crank voltage time > 0.100 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		is disabled. This diagnostic monitor is relative to the GF9 C6 C6789 clutch pressure control solenoid.			TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		
					service solenoid cleaning procedure active	= FALSE Boolean		
					hydraulic pressure available	= TRUE		
					(hydraulic pressure OR Park/Neutral Stuck on FP OR Neutral Staging Line Pressure Disable) **********	> -999 kPa =TRUE =TRUE **********		
					range shift state	# range shift complete		
					diagnostic clutch test	= OFF GOING CLUTCH TEST		
					transmission output shaft speed	> 89.0 RPM		
					((C6 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable)	= TRUE = 1 (1 to enable, 0 to disable)	exhaust delay by shift tvoe:	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					OR C6 off going clutch command pressure)	< 235 kPa	closed throttle upshift: **C6 exhaust delay closed throttle lift foot up shift** open throttle upshift: **C6 exhaust delay open throttle power on up shift** garage shifts: **C6 exhaust delay garage shift** closed throttle downshift: **C6 exhaust delay garage shift** negative torque upshift: **C6 exhaust delay negative torque up shift** open throttle downshift: **C6 exhaust delay open throttle power down shift**	
					(engine torque AND Primary oncomina stuck	> 8,192 Nm = 0 (0 is enable. 1 is		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					on torque enable cal) OR (primary oncoming clutch active primary on coming control state primary on coming commanded pressure)	enable) = TRUE # clutch fill phase > pressure clip threshold according to shift type: closed/open throttle upshifts dependent on oncoming clutch: **C1 Powered Upshift Tq Based Pres Clip** OR **C2 Powered Upshift Tq Based Pres Clip** OR **C3 Powered Upshift Tq Based Pres Clip** OR **C4 Powered Upshift Tq Based Pres Clip** OR **C5 Powered Upshift Tq Based Pres Clip** coasting downshift dependent on oncoming clutch: **C1 Coasting Downshift Tq Based Pres Clip**	Post-torque phase delay for powered upshifts is dependent on the oncoming clutch: **C1_Oncoming Post-Torque Phase Delay** OR **C2_Oncoming Post-Torque Phase Delay** OR **C3_Oncoming Post-Torque Phase Delay** OR **C4_Oncoming Post-Torque Phase Delay** OR **C5_Oncoming Post-Torque Phase Delay**	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						OR **C2 Coasting Downshift Tq Based Pres Clip** OR **C3 Coasting Downshift Tq Based Pres Clip** OR **C4 Coasting Downshift Tq Based Pres Clip** OR **C5 Coasting Downshift Tq Based Pres Clip** clip thresholds for all other shift types: garage shifts: **Clutch Clip Press GS Shifts** negative torque upshift: **Clutch Clip Press NU Shifts** open throttle downshift: **Clutch Clip Press PD Shifts**		
					C6 clutch slip speed valid, all speed sensors are functional for lever node clucth slip speed calculation ********** conditions needed to trigger test: (current shift type AND	= TRUE ********** # Garage shift		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					shift type enable cal for current shift type) OR (Intrusive shift active AND shift type enable cal for garage shift AND Attained Gear AND (stuck on enable cal for forward garge shifts AND driver requested direction AND commanded gear) OR (stuck on enable cal for reverse garage shifts AND driver requested direction AND commanded gear)) clutch stuck off intrusive shift active startle mitigation active (see note on startle mitigation below) (new clutch controller has been initalized OR transitioning to a different clutch controller) current clutch solenoid test state	**Clutch Stuck On Shift = Type Enable** (0 table value will disable, 1 will enable) = FALSE = 0 (0 will enable, 1 will enable) = NEUTRAL OR commanded gear = 0 (0 to disable, 1 to enable) = FORWARD = a FORWARD gear = 0 (0 to disable, 1 to enable) = REVERSE = REVERSE = FALSE = FALSE = TRUE = TRUE transitions to TestState or TUT_HOLD (see note below about state		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
						transitions)		
					**********	**********		
					DTCs not fault pending	P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6		
					DTCs not fault active	P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA		
					DTCs not test fail this key on	P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P2820 P178F P17C6 P17C4 P17C7 P172AP172B		
					**********	**********		
					NOTE: Clutch control			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					solenoid test state TIE UP TEST HOLD is necessary, as it is possible to have multiple off going clutches during one automatic transmission shift. Clutch control solenoid test state is set to TIE UP TEST HOLD during an automatic transmission shift due to two conditions: Current value of clutch control solenoid test state is TIE UP TEST TEST STATE, when one off going clutch pressure control solenoid stuck on diagnostic monitor is currently executing. AND That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed > clutch slip speed fail threshold. Once clutch control solenoid test state is set to TIE UP TEST HOLD, it remains TIE UP TEST HOLD during the automatic transmission shift, until: An additional off going clutch occurs, as indicated by solenoid stuck on test trigger = TRUE, subsequently clutch control solenoid			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					test state is reset to TIE UP TEST TEST STATE, to allow the additional corresponding off going clutch pressure control solenoid stuck on diagnostic monitor to execute. OR The automatic transmission shift completes, range shift state = range shift complete. NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control solenoid stuck on failure mode that occurs during steady state gear, not during an automatic transmission shift. The startle mitigation active then forces the transmission clutch pressure control system to a safe gear or neutral state, based on the active and inactive clutches, when the unintended vehicle deceleration occurred. Once a safe vehicle gear state is attained, the gear and clutch pressure control system allows transitions of the clutches on and off, to sequence automatic			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					transmission shifts, single step shifts. As each single step automatic transmission shift occurs the normal pressure control solenoid stuck on diagnostic monitors execute to verify which clutch pressure control solenoid is in the stuck on failure mode, allowing one of the clutch pressure control solenoid stuck on DTCstoset P0747, P0777, P0797, P2715, P2724, P2733, P2821.			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid F Control Circuit Open	P2736	Controller specific circuit diagnoses 9 speed (C6789/SOWC CBR1) clutch, 10 speed C45678910R clutch, 8 speed Line Pressure Control Circuit, or CVT binary pump, solenoid for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit	> 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid F Control Circuit Low	P2738	Controller specific circuit diagnoses 9 speed (C6789/SOWC CBR1), 10 speed C4567891OR clutch, 8 speed line pressure control, or CVT binary pump, solenoid for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid F Control Circuit High	P2739	Controller specific circuit diagnoses 9 speed (C6789/SOWC CBR1), 10 speed C4567891OR clutch, 8 speed line pressure control, or CVT binary pump, solenoid for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid A Calibration Incorrect	P27A7	The diagnostic monitor verifies that the pressure control solenoid A (GF9 line or GR10C1 C123456R clutch or CVT secondary pulley) characterization data is programmed correctly into the TCM EEPROM to match the pressure control solenoid A electrical characteristics of the device currently installed in the transmission valve body assembly.	pressure control solenoid characterization data programming complete Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry. pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present: Solenoid data is not programmed or incomplete data fault - occurs when a new or service TCM is installed. OR Solenoid class programming fault - the characterization data indicates a different type of device than the TCM calibration data OR Checksum mismatch - the checksum that was calculated from the programmed pressure control solenoid characterization data region does not match the calculated valve at the time of programming. OR Axis data fault - pressure	= FALSE	Pressure control solenoid characterization data is programmed originally at vehicle plant assembly based on transmission valve body assembly part number associated to the unit installed in vehicle. When valve body is serviced, dealership performs reprogramming of TCM with pressure control solenoid characterization data based on the associated transmission valve body part number installed.		execution of monitor occurs once per controller normal power up event during the controller initialization before normal controller time loop execution	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			control solenoid characterization data has one or more points that are less than the previous match point, axis data must be greater than or equal to previous data values.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid B Calibration Incorrect	P27A8	The diagnostic monitor verifies that the pressure control solenoid B (GF9 TCC or GR10 C2 C128910R clutch or CVT primary pulley) characterization data is programmed correctly into the TCM EEPROM to match the pressure control solenoid B electrical characteristics of the device currently installed in the transmission valve body assembly.	pressure control solenoid characterization data programming complete Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry. pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present: Solenoid data is not programmed or incomplete data fault - occurs when a new or service TCM is installed. OR Solenoid class programming fault - the characterization data indicates a different type of device than the TCM calibration data OR Checksum mismatch - the checksum that was calculated from the programmed pressure control solenoid characterization data region does not match the calculated valve at the time of programming. OR Axis data fault - pressure	= FALSE	Pressure control solenoid characterization data is programmed originally at vehicle plant assembly based on transmission valve body assembly part number associated to the unit installed in vehicle. When valve body is serviced, dealership performs reprogramming of TCM with pressure control solenoid characterization data based on the associated transmission valve body part number installed.		execution of monitor occurs once per controller normal power event during the controller initialization before normal time loop execution	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			control solenoid characterization data has one or more points that are less than the previous match point, axis data must be greater than or equal to previous data values.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid C Calibration Incorrect	P27A9	The diagnostic monitor verifies that the pressure control solenoid C (GF9 C1 CB123456 clutch or GR10C3 C23457910 clutch or CVT line) characterization data is programmed correctly into the TOM EEPROM to match the pressure control solenoid C electrical characteristics of the device currently installed in the transmission valve body assembly.	pressure control solenoid characterization data programming complete Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry. pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present: Solenoid data is not programmed or incomplete data fault - occurs when a new or service TCM is installed. OR Solenoid class programming fault - the characterization data indicates a different type of device than the TCM calibration data OR Checksum mismatch - the checksum that was calculated from the programmed pressure control solenoid characterization data region does not match the calculated valve at the time of programming. OR Axis data fault - pressure	= FALSE	Pressure control solenoid characterization data is programmed originally at vehicle plant assembly based on transmission valve body assembly part number associated to the unit installed in vehicle. When valve body is serviced, dealership performs reprogramming of TCM with pressure control solenoid characterization data based on the associated transmission valve body part number installed.		execution of monitor occurs once per controller normal power up event during the controller initialization before normal controller time loop execution	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			control solenoid characterization data has one or more points that are less than the previous match point, axis data must be greater than or equal to previous data values.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid D Calibration Incorrect	P27AA	The diagnostic monitor verifies that the pressure control solenoid D (GF9 C2 CB29 clutch or GR10 C5C1356789 clutch pressure or CVT C1 clutch) characterization data is programmed correctly into the TCM EEPROM to match the pressure control solenoid D electrical characteristics of the device currently installed in the transmission valve body assembly.	pressure control solenoid characterization data programming complete Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry. pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present: Solenoid data is not programmed or incomplete data fault - occurs when a new or service TCM is installed. OR Solenoid class programming fault - the characterization data indicates a different type of device than the TCM calibration data OR Checksum mismatch - the checksum that was calculated from the programmed pressure control solenoid characterization data region does not match the calculated valve at the time of programming. OR Axis data fault - pressure	= FALSE	Pressure control solenoid characterization data is programmed originally at vehicle plant assembly based on transmission valve body assembly part number associated to the unit installed in vehicle. When valve body is serviced, dealership performs reprogramming of TCM with pressure control solenoid characterization data based on the associated transmission valve body part number installed.		execution of monitor occurs once per controller normal power up event during the controller initialization before normal controller time loop execution	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			control solenoid characterization data has one or more points that are less than the previous match point, axis data must be greater than or equal to previous data values.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid E Calibration Incorrect	P27AB	The diagnostic monitor verifies that the pressure control solenoid E (GF9 C3 CB38 clutch or GR10 C4 C2346781OR clutch or CVTTCC) characterization data is programmed correctly into the TCM EEPROM to match the pressure control solenoid E electrical characteristics of the device currently installed in the transmission valve body assembly.	pressure control solenoid characterization data programming complete Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry. pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present: Solenoid data is not programmed or incomplete data fault - occurs when a new or service TCM is installed. OR Solenoid class programming fault - the characterization data indicates a different type of device than the TCM calibration data OR Checksum mismatch - the checksum that was calculated from the programmed pressure control solenoid characterization data region does not match the calculated valve at the time of programming. OR Axis data fault - pressure	= FALSE	Pressure control solenoid characterization data is programmed originally at vehicle plant assembly based on transmission valve body assembly part number associated to the unit installed in vehicle. When valve body is serviced, dealership performs reprogramming of TCM with pressure control solenoid characterization data based on the associated transmission valve body part number installed.		execution of monitor occurs once per controller normal power up event during the controller initialization before normal controller time loop execution	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			control solenoid characterization data has one or more points that are less than the previous match point, axis data must be greater than or equal to previous data values.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid F Calibration Incorrect	P27AC	The diagnostic monitor verifies that the pressure control solenoid F (GF9 C4 C4 clutch or GR10 C6 C4567891OR clutch or CVT binary pump) characterization data is programmed correctly into the TCM EEPROM to match the pressure control solenoid F electrical characteristics of the device currently installed in the transmission valve body assembly.	pressure control solenoid characterization data programming complete Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry. pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present: Solenoid data is not programmed or incomplete data fault - occurs when a new or service TCM is installed. OR Solenoid class programming fault - the characterization data indicates a different type of device than the TCM calibration data OR Checksum mismatch - the checksum that was calculated from the programmed pressure control solenoid characterization data region does not match the calculated valve at the time of programming. OR Axis data fault - pressure	= FALSE	Pressure control solenoid characterization data is programmed originally at vehicle plant assembly based on transmission valve body assembly part number associated to the unit installed in vehicle. When valve body is serviced, dealership performs reprogramming of TCM with pressure control solenoid characterization data based on the associated transmission valve body part number installed.		execution of monitor occurs once per controller normal power up event during the controller initialization before normal controller time loop execution	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			control solenoid characterization data has one or more points that are less than the previous match point, axis data must be greater than or equal to previous data values.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid G Calibration Incorrect	P27AD	The diagnostic monitor verifies that the pressure control solenoid G (GF9 C5 C57R clutch orGRIO line or CVT mode valve A ETRS only) characterization data is programmed correctly into the TOM EEPROM to match the pressure control solenoid G electrical characteristics of the device currently installed in the transmission valve body assembly.	pressure control solenoid characterization data programming complete Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry. pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present: Solenoid data is not programmed or incomplete data fault - occurs when a new or service TCM is installed. OR Solenoid class programming fault - the characterization data indicates a different type of device than the TCM calibration data OR Checksum mismatch - the checksum that was calculated from the programmed pressure control solenoid characterization data region does not match the calculated valve at the time of programming. OR Axis data fault - pressure	= FALSE	Pressure control solenoid characterization data is programmed originally at vehicle plant assembly based on transmission valve body assembly part number associated to the unit installed in vehicle. When valve body is serviced, dealership performs reprogramming of TCM with pressure control solenoid characterization data based on the associated transmission valve body part number installed.		execution of monitor occurs once per controller normal power up event during the controller initialization before normal controller time loop execution	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			control solenoid characterization data has one or more points that are less than the previous match point, axis data must be greater than or equal to previous data values.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid H Calibration Incorrect	P27AE	The diagnostic monitor verifies that the pressure control solenoid H (GF9 C6 C6789 clutch orGRIO TCC or CVT mode valve B ETRS only) characterization data is programmed correctly into the TCM EEPROM to match the pressure control solenoid H electrical characteristics of the device currently installed in the transmission valve body assembly.	pressure control solenoid characterization data programming complete Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry. pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present: Solenoid data is not programmed or incomplete data fault - occurs when a new or service TCM is installed. OR Solenoid class programming fault - the characterization data indicates a different type of device than the TCM calibration data OR Checksum mismatch - the checksum that was calculated from the programmed pressure control solenoid characterization data region does not match the calculated valve at the time of programming. OR Axis data fault - pressure	= FALSE	Pressure control solenoid characterization data is programmed originally at vehicle plant assembly based on transmission valve body assembly part number associated to the unit installed in vehicle. When valve body is serviced, dealership performs reprogramming of TCM with pressure control solenoid characterization data based on the associated transmission valve body part number installed.		execution of monitor occurs once per controller normal power up event during the controller initialization before normal controller time loop execution	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			control solenoid characterization data has one or more points that are less than the previous match point, axis data must be greater than or equal to previous data values.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control A Position Sensor/ Switch Circuit/Open	P27EB	The diagnostic monitor detects an illegal voltage on the mode valve A position sensor circuit.	raw sensor voltage raw sensor voltage	> 1.263 volts < 1.504 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system configuration is internal ERTS	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control A Position Sensor/ Switch Circuit Range/ Performance	P27EC	Sensor signal fails to transition when solenoid mode valve control commands to PARK, DRIVE or REVERSE occur.	Mode Valve A Position ETRS Commanded Dirctn AND mode valve A pressure ETRS Commanded Dirctn AND mode valve A pressure IF (Mode Valve A Steady State Fault Pending) MVA Sensor Fail Limit Increment MVA Sensor Fail Timer	≠ **Mode Valve A Final State** = Drive > 195.00 # Drive < 25.00 = TRUE = **Mode Valve A Steady State Fail Lim**	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) ETRS commanded direction P18AATest Fail This Key On P27EB Fault Active AND P27ED Fault Active AND P27EE Fault Active AND P18ABTest Fail This Key On AND P27EC Test Fail This Key On IF (Mode Valve A Position OR Mode Valve A Position) Increment Steady State Delay Steady State Delay IF (ETRS Commanded Dirctn IF (Park Servo State AND Line Pressure AND Line Pressure Control))	= TRUE = TRUE = ETRS diagnostic range = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE ≠ **Mode Valve A Final State** # Mode Valve A Command > **Mode Vlv StdySt Park Dly Lim** = PARK = PARK > 450.00 # Diag Min Press	IF MVA Sensor Fail > MVA Sensor Fail Limit update rate 6.25 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Execute Sensor Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control)) Execute Sensor Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control) Execute Slip Determination Increment Slip Delay Slip Delay Slip Detected (see mode valve slip detected definition) Execute Sensor Fail	= NeutLo # OUT OF PARK > 450.00 # Diag Min Press = Drive or Reverse # PARK < 450.00 = Diag Min Press > **ETRS Mode Valve A turbine delay** = No Slip Detected		
			Mode Valve A Position	≠ **Mode Valve A Final State**	ETRS Performance Diag Enabl (see ETRS performance diag enabl	= TRUE	IF MVA Sensor Fail > MVA Sensor	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					description)		Fail Limit	
			ETRS Commanded Dirctn AND	= Drive	ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description)	= TRUE	update rate 6.25 milliseconds	
			mode valve A pressure	> 195.00				
			ETRS Commanded Dirctn AND	= Park	Auto-Stop Active	= FALSE		
					High Side Driver 1	= TRUE		
			mode valve A pressure	< 25.00	High Side Driver 2	= TRUE		
			IF (Mode Valve A Steady State Fault Pending)	= FALSE	ETRS commanded direction	# ETRS diagnostic range		
			MVA Sensor Fail Limit	= **Mode Valve A Fail Lim**	((Driver command	= Park		
					P2812 Fault Active	= FALSE		
			Increment MVA Sensor Fail Timer		P2815 Fault Active	= FALSE		
					P0970 Fault Active	= FALSE		
					P2720 Fault Active)	= FALSE		
					OR			
					(Driver command	# Park		
					P2814 Fault Active	= FALSE		
					(P0968 Fault Active	= FALSE		
					P0971 Fault Active)	= FALSE		
					OR			
					(P2718 Fault Active	= FALSE		
					P2721 Fault Active)))	= FALSE		
					Mode Enbl Vlv Stk On Test	= FALSE		
					P18AFTest Fail This Key On	= FALSE		
					IF			
					(((Mode Valve A St Attnd (see mode valve A st attnd description) AND	= FALSE		
					Mode Valve ATrnstn (see mode valve A trnstn description))AND	= FALSE		
					(Diagnostic Range OR	= NeutShf		
					Mode Valve B Trnstn (see mode valve B trnstn	= TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					description) OR Mode Valve B St Attnd (see mode valve B st attnd description) OR (0 line pressure command AND Mode Valve A Position)))	 = TRUE = TRUE = HIGH		
					IF Diagnostic Enable AND	 = 1.00		
					((ETR8 commanded direction AND Mode Valve A pressure OR 0 line pressure command) OR (ETRS commanded direction AND ETRS diagnostic range AND Mode Valve A pressure))	= Park < 25.00 = TRUE = Drive = Park > 195.00		
					Increment Delay Timer Delay Limit	 = ModeVlvA_TrnstnDly [ETRS diagnostic range] [ETRS commanded direction] (see supporting tables for specific delay associated with each shift)		
					Delay Timer	> Delay Limit		
					Set Mode Valve A sensor Fault Pending			
					P18AATest Fail This Key On	= FALSE		
					P27EB Fault Active	= FALSE		
					P27ED Fault Active	= FALSE		
					P27EE Fault Active	= FALSE		
					P18ABTest Fail This Key	= FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					On P27EC Test Fail This Key On Execute Sensor Fault	= FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control A Position Sensor/ Switch Circuit Low	P27ED	The diagnostic monitor detects a ground short or open circuit fault on the mode valve A position sensor circuit.	raw sensor voltage	< 0.414 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system configuration is internal ERTS	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control A Position Sensor/ Switch Circuit High	P27EE	The diagnostic monitor detects a short to voltage on the mode valve A position sensor circuit.	raw sensor voltage	> 2.538 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system configuration is internal ERTS	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control B Position Sensor/ Switch Circuit/Open	P27EF	The diagnostic monitor detects an illegal voltage on the mode valve B position sensor circuit.	raw sensor voltage raw sensor voltage	> 1.263 volts < 1.504 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system configuration is internal ERTS	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control B Position Sensor/ Switch Circuit Range/ Performance	P27F0	Sensor signal fails to transition when solenoid mode valve control commands to PARK, REVERSE, NEUTRAL HI, NEUTRAL LO, NEUTRAL SHIFT or DRIVE occur.	Mode Valve B Position ETRS Commanded Dirctn AND mode valve B pressure OR ETRS Commanded Dirctn AND mode valve A pressure IF (Mode Valve A Steady State Fault Pending) MVB Sensor Fail Limit Increment MVB Sensor Fail Timer	≠ **Mode Valve B Final State** = Reverse > 295.00 = Park, NeutLo, Drive < 25.00 = TRUE = **Mode Valve B Steady State Fail Lim**	ETRS Performance Diag Enabl (see ETRS performance diag enabl description) ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) ETRS commanded direction P18ACTest Fail This Key On P27EF Fault Active P27F1 Fault Active P27F2 Fault Active P18ADTest Fail This Key On P27F0 Test Fail This Key On IF (Mode Valve B Position OR Mode Valve B Position) Increment Steady State Delay Steady State Delay IF (ETRS Commanded Dirctn IF (Park Servo State AND Line Pressure AND Line Pressure Control))	= TRUE = TRUE = ETRS diagnostic range = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE ≠ **Mode Valve B Final State** # Mode Valve B Command > **Mode Vlv StdySt Park Dly Lim** = PARK = PARK < 450.00 # Diag Min Press	IF MVB Sensor Fail > MVB Sensor Fail Limit update rate 6.25 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Execute Sensor Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State AND Line Pressure AND Line Pressure Control)) Execute Sensor Fail ELSE IF (ETRS Commanded Dirctn IF (Park Servo State OR Line Pressure OR Line Pressure Control) Execute Slip Determination Increment Slip Delay Slip Delay Slip Detected (see mode valve slip detected definition) Execute Sensor Fail	= NeutLo # OUT OF PARK > 450.00 # Diag Min Press = Drive or Reverse # PARK < 450.00 = Diag Min Press > **ETRS Mode Valve B turbine delay** = Slip Detected		
			Mode Valve B Position	≠ **Mode Valve B Final State**	ETRS Performance Diag Enabl (see ETRS performance diag enabl description)	= TRUE	IF MVB Sensor Fail > MVB Sensor Fail Limit	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			ETRS Commanded Dirctn AND mode valve B pressure ETRS Commanded Dirctn AND mode valve A pressure IF (Mode Valve A Steady State Fault Pending) MVB Sensor Fail Limit Increment MVB Sensor Fail Timer	= Reverse, NeutLo, NeutHi, NeutShf > 295.00 = Park < 25.00 = TRUE = **Mode Valve B Steady State Fail Lim**	ETRS Hydraulic Pressure Avail (see ETRS hydraulic pressure avail description) Auto-Stop Active High Side Driver 1 High Side Driver 2 ETRS commanded direction ((Driver command P2812 Fault Active P2815 Fault Active P0970 Fault Active P2720 Fault Active) OR (Driver command P2814 Fault Active (P0968 Fault Active P0971 Fault Active) OR (P2718 Fault Active P2721 Fault Active))) Mode Enbl Vlv Stk On Test P18AFTest Fail This Key On IF ((((Mode Valve B St Attnd (see mode valve B st attnd description) AND Mode Valve B Trnstn (see mode valve B trnstn description))AND (Diagnostic Range OR Mode Valve A Trnstn (see mode valve A trnstn description) OR Mode Valve A St Attnd (see mode valve A st	= TRUE = FALSE = TRUE = TRUE # ETRS diagnostic range = Park = FALSE = FALSE = FALSE = FALSE # Park = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = NeutShf = TRUE = TRUE	update rate 6.25 milliseconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					attnd description) OR (0 line pressure command AND Mode Valve B Position)))	 = TRUE = HIGH		
					IF Diagnostic Enable	 = 1.00		
					((ETRS Commanded Dirctn AND Mode Valve B pressure AND Park Servo Position) OR (ETRS Commanded Dirctn AND ETRS Diagnostic Range AND Park Servo Position AND Mode Valve B pressure))	= Park < 25.00 = PARK = Reverse, NeutLo, NeutHi, NeutShf = Park = OUT OF PARK > 295.00		
					Increment Delay Timer Delay Limit Delay Timer	 = ModeVlvB_TrnstnDly [ETRS diagnostic range] [ETRS commanded direction] (see supporting tables for specific delay associated with each shift) > Delay Limit		
					Set Mode Valve B sensor Fault Pending	= TRUE		
					P18ACTest Fail This Key On P27EF Fault Active P27F1 Fault Active P27F2 Fault Active P18ADTest Fail This Key	= FALSE = FALSE = FALSE = FALSE = FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					On P27F0 Test Fail This Key On Execute Sensor Fault	= FALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control B Position Sensor/ Switch Circuit Low	P27F1	The diagnostic monitor detects a ground short or open circuit fault on the mode valve B position sensor circuit.	raw sensor voltage	> 0.414 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system configuration is internal ERTS	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Transmission Range Control B Position Sensor/ Switch Circuit High	P27F2	The diagnostic monitor detects a short to voltage on the mode valve B position sensor circuit.	raw sensor voltage	> 2.538 volts	diagnostic monitor enable battery voltage battery voltage time ETRS system configuration is internal ERTS	= 1 Boolean > 8.00 volts > 1.00 seconds = CeTRGR_e_InternalETRS	0.100 seconds in 0.163 second sample 6.25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid G Control Circuit Open	P2812	Controller specific circuit diagnoses 9 speed Line Pressure Control Circuit, 10 speed Line Pressure Control Circuit, 8 speed TCC Control, or CVT Mode Valve A Circuit for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit	> 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid G Control Circuit Low	P2814	Controller specific circuit diagnoses 9 speed Line Pressure Circuit, 10 speed Line Pressure Circuit, 8 speed TCC Control, or CVT Mode Valve A Circuit for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid G Control Circuit High	P2815	Controller specific circuit diagnoses 9 speed Line Pressure Circuit, 10 speed Line Pressure Circuit, 8 speed TCC Control, or CVT Mode Valve A Circuit for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage	< 0.5 0 impedance between signal and controller voltage source When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid H Performance /Stuck Off - GF9 Specific	P2817	The diagnostic monitor detects the transmission torque converter control valve solenoid failed hydraulically off. The monitor executes when the transmission torque converter is commanded to a “lock” mode during which the torque converter will be controlled to near zero (0.0) RPM slip speed, or, an “on” mode during which the torque converter will be controlled to target slip speed using slip speed error. The transmission torque converter control valve solenoid is considered failed hydraulically off when the “lock” mode slip speed is excessive, or, when the ‘on” mode slip speed error is excessive.	if use (TCC slip speed error OR TCC control mode) TCC slip speed error = TCC slip speed - TCC command slip speed else if TCC control mode torque convert slip = engine speed - transmission input shaft speed then update fail time 25 millisecond update rate	= 0 Boolean = ON mode (controlled slip mode) > **P2817TCC stuck off fail TCC slip speed** see supporting table = LOCK > 130.0 RPM	diagnostic monitor enable TCC command capacity TCC command pressure (TCC control mode previous TCC control mode previous TCC control mode previous) AND (TCC control mode current OR TCC control mode current) (TCC stuck off enable OR TCC stuck on enable) hydraulic pressure available: engine speed	= 1 Boolean > 0.00 % > 800.0 kPa # TCC control mode current # ON mode (controlled slip mode) # LOCK = ON mode (controlled slip mode) = LOCK = 1 Boolean = 1 Boolean > 500.0 RPM	fail time > 2.500 seconds increment fail count fail count > 3 counts 25 millisecond update rate TCC command capacity time > 0.00 seconds TCC command pressure time > 2.00 seconds engine speed time > **engine speed time for transmission hydraulic pressure available**	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
							see supporting table	
					service fast learn active	= FALSE		
					battery voltage	> 9.00 volts	battery voltage time > 0.100 seconds	
					run crank voltage	> 9.00 volts	run crank voltage time > 0.100 seconds	
					(PTO active OR PTO disable calibration)	= FALSE = 1 Boolean		
					accelerator pedal position	> 8.0 %		
					accelerator pedal position	< 100.0 %		
					range shift state	= range shift complete		
					transmission fluid temperature	> -6.66 °C		
					transmission fluid temperature	< 130.0 °C		
					engine torque	> 50.0 Nm		
					engine torque	< 8,191.8 Nm		
					P2817 test fail this key on	= FALSE		
					(TCC control mode OR TCC control mode)	= ON mode (controlled slip mode) = LOCK		
					attained gear	> CeCGSR_e_CR_Third		
					attainded gear slip	< 25.00 RPM		
					DTCs not fault active	AcceleratorPedalFailure EngineTorqueEstInaccurate P281B, P281D, P281E, P0716, P0717, P07BF, P07C0 P0722, P0723, P077C, P077D		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					DTCs not fault pending	P0722, P0723, P0716, P0717, P07BF, P07C0		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid H Stuck On - GF9 specific	P2818	The diagnostic monitor detects if the TCC Variable Force Solenoid (VFS) H is on incorrectly, the solenoid electrical circuit not damaged, but the solenoid has failed hydraulically to an on state. In this failure mode hydraulic fluid is routed wrongly to engage both the TCC Regulator Valve and the TCC Control Valve. This will allow hydraulic fluid pressure to immediately apply the TCC when the Clutch Select Valve is disabled.	When Stuck on crash detected monitor TCC Slip - torque convert slip speed = ABS(engine speed - transmission input shaft speed) WHILE TCC Slip AND TCC Slip THEN Increment TCC Stuck On fail timer 25 millisecond update rate	 > -50.0 RPM < 30.0 RPM	Diagnostic monitor enable accelerator pedal position signal available hydraulic pressure available: Engine speed service fast learn active battery voltage run crank voltage P281B fault active P281D fault active P281E fault active P0716 fault active P0717 fault active P07BF fault active P07C0 fault active P0722 fault active P0723 fault active P077C fault active P077D fault active P0722 fault pending P0723 fault pending P0716 fault pending P0717 fault pending P07BF fault pending P07C0 fault pending ********** PRNDL PRNDL Commanded gear Commanded gear (PTO active OR PTO disable calibration)	= 1 (1 enable, 0 disable) = TRUE = TRUE > 500.0 RPM = FALSE > 9.00 volts > 9.00 volts = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE ********** # NEUTRAL # REVERSE # NEUTRAL # REVERSE = FALSE = 1 Boolean	fail time > 1.500 seconds increment fail count fail count > 4 counts 25 millisecond update rate	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					transmission fluid temperature	> -6.66 °C		
					transmission fluid temperature	< 130.00 °C		
					engine torque	> 55.0 Nm		
					engine torque	< 800.0 Nm		
					P2818 test fail this key on	= FALSE		
					vehicle speed	< 45.0 KPH		
					engine speed	> 400.0 RPM		
					engine speed	< 5,500.0 RPM		
					accelerator pedal position	< 95.0 %		
					4WD low state	= FALSE		
					(driver shift mode active OR	= FALSE		
					driver shift mode calibration)	= 0 Boolean		
					(clucth control solenoid stuck on OR stuck OFF intrusive shift active)	= FALSE		
					P0746 fault pending	= FALSE		
					P0747 fault pending	= FALSE		
					P0776 fault pending	= FALSE		
					P0777 fault pending	= FALSE		
					P0796 fault pending	= FALSE		
					P0797 fault pending	= FALSE		
					P2714 fault pending	= FALSE		
					P2715 fault pending	= FALSE		
					P2723 fault pending	= FALSE		
					P2724 fault pending	= FALSE		
					P2732 fault pending	= FALSE		
					P2733 fault pending	= FALSE		
					P2820 fault pending	= FALSE		
					P2821 fault pending	= FALSE		
					vehicle soeed	< 8.0 KPH		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					accelerator pedal position accelerator pedal position hysteresis ********** when: break latch state (clutch select valve solenoid) IF previous break latch state (clutch select valve solenoid) set stuck on test time and begin time down, ELSE stuck on test time must time down from calibration value to zero (0.0) seconds break latch state (clutch select valve solenoid) AND previous break latch state (clutch select valve solenoid) THEN initialize control valve test time, control valve test time must time down from calibration value to zero (0.0) seconds WHILE control valve test time OR TCC Stuck On fail time IF TCC slip Decelelation	> 4.0 % > 1.0 % ********** = disabled (clutch select valve not transitioning) = complete (clutch select valve transition complete) = **P2818 stuck on test time** see supporting tables = clutch select valve solenoid mutliplexed to TCC hydraulic = disabled (clutch select valve not transitioning) = **P2818 (GF9 specific) control valve test time** see supporting tables #0 #0 <		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					AND TCC slip Stuck on crash detected	**P2818GF9 TCC Stuck On Crash Decel limit** **P2818 GF9 Establish crash slip limit** = TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid H Control Circuit Open	P281B	Controller specific circuit diagnoses 9 speed TCC Control Circuit, 10 speed TCC Control Circuit, 8 speed T93 Default Valve Control Circuit, or CVT Mode Valve B Control Circuit for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit	> 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid H Control Circuit Low	P281D	Controller specific circuit diagnoses 9 speed TCC Pressure Control Circuit, 10 speed TCC Control Circuit, 8 speed Default Valve Control Circuit, or CVT Mode Valve B for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds. For 8 speed T87a controllers, an open circuit on the Default Valve Control Circuit will also set P281D.	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid H Control Circuit High	P281E	Controller specific circuit diagnoses 9 speed TCC Pressure Control Circuit, 10 speed TCC Control Circuit, 8 speed Default Valve Control Circuit, or CVT Mode Valve B Control Circuit for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage	< 0.5 0 impedance between signal and controller voltage source When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD2 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control (PC) Solenoid J Stuck Off (GF9)	P2820	Each pressure control solenoid stuck off diagnostic monitor detects a control solenoid failed hydraulically off, while the solenoid is electrically functional. This diagnostic monitor detects the clutch select valve solenoid failed hydraulically off. The clutch select valve is used to route hydraulic fluid to, either, the selectable one way clutch hydraulic circuit used to attain transmission 1st gear lock state, or, to the C6 - C6789 clutch hydraulic circuit necessary for transmission higher gear states. When the clutch select valve is failed hydraulically off, and transmission is in 1st gear lock state, it is possible to measure low C6 - C6789 clutch slip speed or 6th gear transmission ratio, since hydraulic fluid is routed to the clutch C6 - C6789. This can be determined based on transmission lever node design, the	(gear ratio AND gear ratio) OR C6 clutch slip speed update fail time 6.25 milliscond update	< 1.700 > 1.200 < 20.0 RPM	**********	**********	fail time > 0.250 seconds, update fail count, fail count > 3 counts 6.25 milliscond update	Type A, 1 Trips
					system-level enables:			
					use battery voltage calibration is FALSE	= 1 Boolean		
					OR			
					(use battery voltage calibration is TRUE	= 1 Boolean	battery voltage time > 0.100 seconds	
					AND			
					battery voltage)	> 9.00 volts		
					use run crank voltage calibration is FALSE	= 1 Boolean		
					OR		run crank voltage time > 0.100 seconds	
					(use run crank voltage calibration is TRUE	= 1 Boolean		
					AND			
					run crank voltage)	> 9.00 volts		
					TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled	= TRUE Boolean		
					service fast learn active	= FALSE Boolean		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		transmission input shaft speed, the transmission output shaft speed, and one transmission intermediate shaft speed, while not commanding 6th-9th gear. This diagnostic monitor is relative to the GF9 clutch select valve pressure control solenoid.			service solenoid cleaning procedure active hydraulic pressure available ********** diagnostic monitor enabled transmission output shaft speed transmission fluid temperature transmission fluid temperature (command gear AND attained gear) OR (attained gear AND SOWC state) C6 clutch slip speed valid ********** DTCs not fault pending DTCs not fault active	= FALSE Boolean = TRUE ********** = 1 (1 to enable, 0 to disable) > 35 RPM > -256.00 °C < 130.0 °C = 1st lock = 1st lock = 2nd lock = APPLY COMPLETE = TRUE ********** P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6 P2534 P0707 P0708 P0716 P0717 P07C0		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					DTCs not test fail this key on	P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P2820 P178F P17C6 P17C4 P17C7 P172AP172B		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid J Stuck On (GF9)	P2821	Each pressure control solenoid stuck on diagnostic monitor detects a clutch pressure control solenoid failed hydraulically on, while the solenoid is electrically functional. The clutch select pressure control solenoid must be hydraulically off and the clutch select valve in the off state, to allow hydraulic fluid supply to the C3 (CB38) or C4 (C4) or C5 (C57R) clutches, such that when activated, commanded gear 3rd or 4th or 5th can be attained. With the clutch select valve pressure control solenoid failed hydraulically on, commanded gear 3rd or 4th or 5th cannot be attained. In the failure mode, the clutch slip speed, and gear box gear slip, will be excessive, not near or at zero RPM, when commanding 3rd or 4th or 5th gear, but due to the clutch select pressure control solenoid failed hydraulically on and not	Cx clutch slip speed fail compare C3 (CB38) OR C4 (C4) OR C5 (C57R) update Cx clutch slip speed fail time 6.25 milliscond update once intrusive gear is commanded and clutch select stuck on test active remains and Cx clutch fail count limit occurs, increment clutch select valve solenoid stuck on fail count and time up clutch select stuck on test gear time 6.25 milliscond update	 > 200.0 RPM > 200.0 RPM > 200.0 RPM = TRUE				Cx clutch slip speed fail time > (C3 (CB38) 1.00 seconds OR C4(C4) 1.00 seconds OR C5 (C57R) 1.00 seconds) update Cx fail count, Cxfail count > (C3 (CB38) 2 counts OR C4 (C4) 2 counts OR C5 (C57R) 2 counts) Cx clutch fail count limit occurs 6.25 milliscond update clutch select valve solenoid stuck on fail count > 2 counts OR clutch select stuck on test gear time > 9.00 seconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		individual clutch control faults. It is thus necessary, when individual clutch slip occurs in 3rd or 4th or 5th gear and counted toward the clutch pressure control solenoid stuck on failure, for an intrusive gear commanded from 3rd or 4th or 5th to verify the clutch slip in the remaining gear states. The individual clutch slip that occurs in those intrusive gears, 3rd or 4th or 5th, is also counted toward the clutch pressure control solenoid stuck on failure. As individual clutch slip is accumulated in each commanded gear 3rd or 4th or 5th, that failure time is the verification of the clutch pressure control solenoid failed hydraulically on. The clutch slip speed is calculated based on the transmission lever node design, requiring transmission input shaft speed, transmission output shaft speed, and, one transmission intermediate shaft speed. The clutch			********** system-level enables: use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled service fast learn active service solenoid cleaning procedure active hydraulic pressure available ********** diaanostic monitor enable	********** = 1 Boolean = 1 Boolean > 9.00 volts = 1 Boolean = 1 Boolean > 9.00 volts = TRUE Boolean = TRUE Boolean = FALSE Boolean = FALSE Boolean = TRUE ********** = 1 Boolean	6.25 milliscond update battery voltage time > 0.100 seconds run crank voltage time > 0.100 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		pressure control solenoid is tested after an automatic transmission shift occurs and has been considered shift complete, or, steady state gear is deemed active, range shift complete. When the automatic transmission shift is complete, steady state gear is considered, the clutch pressure control solenoid is mapped to transmission line pressure control, which normally allows the clutch to maintain full torque holding capacity at the given engine crankshaft torque, to maintain true gear ratio. When the clutch select pressure control solenoid is failed hydraulically on, C3 (CB38) or C4 (C4) or C5 (C57R) clutches cannot maintain holding capacity at any engine crankshaft torque, and the clutch slip speed is uncontrollable. The clutch pressure control solenoid test is suspended if the higher level safety startle mitiqation function is			P2821 test fail this key on test trigger set to TRUE: enable forward gear AND direction request OR enable reverse gear AND direction request current loop test trigger clutch control solenoid test state range shift state clutch solenoid test state set to NEUTRAL TEST when: test trigger initialize range shift complete time, when range shift state, range shift complete time must time down to zero when range shift complete Cx indicates any one of the 3 clutches: C3 (CB38) OR C4 (C4) OR C5 (C57R) enable Cx clutch slip speed fail compare when: diagnostic clutch test Cx ((startle mitigation active OR (startle mitiqation active	= FALSE = 1 Boolean = forward gear = 0 Boolean = reverse gear = FALSE # NEUTRAL TEST = range shift completed = TRUE # range shift completed = HOLDING CLUTCH = FALSE = TRUE	initialize range shift complete time= 1.000 seconds, range shift complete time must time down to zero when range shift complete	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
		active. The safety startle mitigation function is triggered when a sudden vehicle deceleration occurs due to a clutch pressure control solenoid that has failed hydraulically on, while the solenoid is electrically functional, which, must take priority over this clutch select pressure control solenoid stuck off diagnostic monitor. All clutch pressure control solenoid stuck on/off diagnostic monitors are emission MIL DTCs. System voltage must be normal, all clutch pressure control solenoid driver circuits must be functional, no clutch pressure control solenoid electrical or performance faults can be present, and no speed sensor electrical or performance faults can be present, or the a clutch pressure control solenoid stuck off test is disabled. This diagnostic monitor is relative to the GF9 clutch select valve pressure control solenoid.			AND startle mitigation gear)) (see startle mitigation active NOTE below) unintended deceleration fault pending OR unintended deceleration fault pending enable FALSE (startle mitigation) clutch steady state adaptive active transmission output shaft speed Cx clutch slip speed valid, all speed sesnors are functional for lever node clucth slip speed calculation accelerator pedal position engine speed diagnostic clutch test Cx set to HOLDING CLUTCH when: clutch solenoid test state ((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) Cx clutch pressured map ********** clutch select stuck on test active set to TRUE when:	# initial startle mitigation gear = FALSE = 0 Boolean = FALSE > 89.0 RPM > 2.00 % > 1,500.0 RPM = NEUTRAL TEST = FALSE = TRUE # initial startle mitigation gear = mapped to line pressure, Cx clutch pressure has transtioned from off-applying-applied **********		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					command gear clutch control solenoid test state any Cx clutch fail count limit occurs break latch state, clutch select valve hydraulic latch fluid is applied, hydraulic latch fluid force balance acts with clutch select valve return spring, to force the clutch select valve to the off postion in normal operation, allowing hydraulic fluid to C3 (CB38) C4 (C4) and C5 (C57R) clutches clutch select stuck on test active driver direction (PRNDL) change request, select intrusive gear to verify clutch select valve solenoid when HOLDING CLUTCH: C3 (CB38) C4 (C4) C5 (C57R) enable clutch select stuck on test gear time NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797	# REVERSE = NEUTRAL TEST = complete = TRUE = FALSE = CeCGSR_e_Fourth = CeCGSR_e_Fifth = CeCGSR_e_Third		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					P2715P2724 P2733 P2821 ********** DTCs not fault pending DTCs not test fail this key on DTCs not fault active	********** P17CE P1783 P178F P17C6 P17C4 P17C7 P17D3P17C5 P0721 P172AP172B P0716 P0717P07C0 P07BF P0723 P0722 P077D P077C P176CP176D P176B P17D6 P2534 P0707 P0708 P0716 P0717 P07C0 P07BF P077D P077C P126C P176DP17CC P17CD P0962 P0966 P0970 P2720 P2729 P2738 P0963 P0967 P0971 P2721 P2730 P2739 P0960 P0964 P0968 P2718 P2727 P2736 P17CE P1783 P17D3P17C5 P0721 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0723 P0722 P176B P17D6 P0747 P0777 P0797 P2715 P2724 P2733 P0746 P0776 P0796 P2714 P2723 P2732 P2821 P2820 P178F P17C6 P17C4 P17C7 P172AP172B		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid J Control Circuit Open (T93 Controller only)	P2824	Controller specific circuit diagnoses 10 speed Default Disable Control Circuit for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates an open circuit Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit	> 200 K 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid J Control Circuit Low	P2826	Controller specific circuit diagnoses 9 speed Clutch Select Valve Control Circuit, 10 speed Default Disable Control Circuit, or 8 speed Boost Valve Control Circuit for a ground short circuit failure by comparing a voltage measurement to controller specific voltage thresholds. For T87a controllers, an open circuit on solenoid I/J will also set P2826	Voltage measurement outside of controller specific acceptable range indicates a ground short Controller specific circuit voltage thresholds are set to meet the following controller specification for a ground short	< 0.5 0 impedance between signal and controller ground When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.30 seconds out of sample time > 0.50 seconds 6.25 millisecond update rate > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Pressure Control Solenoid J Control Circuit High	P2827	Controller specific circuit diagnoses 9 speed Clutch Valve Control Circuit, 10 speed Default Disable Control Circuit, or 8 speed Boost Valve Control Circuit for a short to voltage circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	Voltage measurement outside of controller specific acceptable range indicates a short to voltage Controller specific circuit voltage thresholds are set to meet the following controller specification for a short to voltage	< 0.5 0 impedance between signal and controller voltage source When malfunction criteria threshold is met, increment fail time and increment sample time, otherwise increment only sample time	battery voltage (run crank voltage OR accessory voltage active OR Power Mode) diagnostic monitor enable calibration (solenoid is mapped to high side driver 1 (CeTSCR_e_HSD1) AND high side driver 1) OR (solenoid is mapped to high side driver 2 (CeTSCR_e_HSD2) AND high side driver 2) OR (solenoid is mapped to high side driver 3 (CeTSCR_e_HSD3) AND high side driver 3)	> 9.00 volts and < 32.00 volts > 5.00 volts = TRUE = ACCESSORY = 1 (1 is enable, 0 is disable) = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON = CeTSCR_e_HSD1 (CeTSCR_e_NoHSD will disable) = ON	fail time > 0.10 seconds out of sample time > 0.17 seconds > 1.00 seconds > 25 milliseconds > 12.5 milliseconds	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Input Power Circuit A/B Correlation	U3018	Detect a Power A vs Power B correlation error	Power A - Power B Voltage	> 3.00 volts	PowerA - Power B Correlation monitoring enable = TRUE Battey Present Starter Motor NOT Engaged	= 1 Boolean Battey Present = TRUE Starter Motor Engaged = FALSE	40 fail counts out of 50 sample counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Input Power Circuit B - Ignition Input On/Start Circuit Correlation	U3024	Detect a Power B vs RuncCrank correlation error	Power B - RunCrank Voltage	> 3.00 volts	PowerB - RunCrank Correlation monitoring enable = TRUE Battey Present RunCrank Active Starter Motor NOT Engaged	= 1 Boolean Battey Present = TRUE RunCrank Active = TRUE Starter Motor Engaged = FALSE	50 fail counts out of 63 sample counts	Type A, 1 Trips

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - intermediate speed sensor 1 or 2 predicted direction

Description:

Value Units: predicted direction: forward, reverse, unknown
X Unit: attained gear
Y Units: intermediate speed sensor 1 or 2

intermediate speed sensor 1 or 2 predicted direction - Part 1			
y/x	CeCGSR_e_CR_NullForSched	CeCGSR_e_CR_Neutral	CeCGSR_e_CR_Park
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 2			
y/x	CeCGSR_e_CR_Reverse	CeCGSR_e_CR_First	CeCGSR_e_CR_Second
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionReverse	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 3			
y/x	CeCGSR_e_CR_Third	CeCGSR_e_CR_Fourth	CeCGSR_e_CR_Fifth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionForward
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 4			
y/x	CeCGSR_e_CR_Sixth	CeCGSR_e_CR_Seventh	CeCGSR_e_CR_Eighth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 5			
y/x	CeCGSR_e_CR_Ninth	CeCGSR_e_CR_Tenth	
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	

Initial Supporting table - P171D hydraulic pressure delay

Description: Time to delay the initial x of y counter due to hydraulic transients. Thresholds are a function of transmission fluid temperature. Horizontal axis is transmission fluid temperature (DegC) and table output is delay time (seconds).

Value Units: delay time seconds
X Unit: transmission fluid temperature DegC

y/x	-40	0	20	30	40	50	60
1	0.090	0.090	0.080	0.050	0.050	0.050	0.050

Initial Supporting table - P171D predicted turbine speed error

Description: Predicted turbine speed vs actual turbine speed error. Thresholds are a function of engine speed and transmission fliud temperature. Diagnostic is considered failing above these values. Table vertical axis is engine speed (RPM), horizontal axis is transmission fluid temperature (DegC) and table output is predicted turbine speed error (RPM).

Value Units: turbine speed RPM error
X Unit: transmission fluid temperature DegC
Y Units: engine speed RPM

y/x	-40	0	10	20	40
0	300	300	300	300	300
500	300	300	300	300	300
1,100	300	300	300	300	300
1,500	300	300	300	300	300
2,500	300	300	300	300	300

Initial Supporting table - P176B delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Description: delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.000	1.000

Initial Supporting table - P176B holding clutch states

Description: inditaces when the clutch states allow transmission intermediate speed sensor evaluation, when rotating components can trigger speed sesnor, holding clutches will not allow evaluation while clutches not holding will allow evaluation

Value Units: TRUE or FALSE
X Unit: intermediate speed sensor select
Y Units: commanded gear

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
CeCGSR_e_CR_NullForSched	1	1
CeCGSR_e_CR_Neutral	1	1
CeCGSR_e_CR_Park	1	1
CeCGSR_e_CR_Reverse	0	1
CeCGSR_e_CR_First	0	1
CeCGSR_e_CR_Second	0	1
CeCGSR_e_CR_Third	1	1
CeCGSR_e_CR_Fourth	0	1
CeCGSR_e_CR_Fifth	0	1
CeCGSR_e_CR_Sixth	0	1
CeCGSR_e_CR_Seventh	1	1
CeCGSR_e_CR_Eighth	0	1
CeCGSR_e_CR_Ninth	0	1
CeCGSR_e_CR_Tenth	1	1

Initial Supporting table - P176B intermediate speed sensor fail count threshold

Description: P176B intermediate speed sensor fail count threshold

Value Units: fail counts
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	4	4

Initial Supporting table - P176B intermediate speed sensor fail time threshold

Description: P176B intermediate speed sensor fail time threshold

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	2.000	2.000

Initial Supporting table - P176B minimum estimated transmission intermediate speed to enable fail evaluation

Description: minimum estimated transmission intermediate speed to enable fail evaluation, where estimate is based on transmission input speed / ratio calibration, where ratio calibration is either P176B ratio calibration when REVERSE or P176B ratio calibration when not REVERSE

Value Units: estimated transmission intermediate speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B minimum transmission input speed to enable fail evaluation

Description: minimum transmission input speed to enable fail evaluation

Value Units: transmission input speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B ratio calibration when not REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is not REVERSE

Value Units: ratio
X Unit: commanded gear
Y Units: intermediate speed sensor select

y/x	CeTGRR_e_Gear1	CeTGRR_e_Gear2	CeTGRR_e_Gear3	CeTGRR_e_Gear4	CeTGRR_e_Gear5	CeTGRR_e_Gear6	CeTGRR_e_Gear7	CeTGRR_e_Gear8	CeTGRR_e_Gear9	CeTGRR_e_Gear10
CeTSRR_e_C2C_ClchSpdSnsr1	1.5848	6.3694	1.0000	1.0000	0.5227	1.0000	1.0000	1.1905	1.0000	1.0000
CeTSRR_e_C2C_ClchSpdSnsr2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P176B ratio calibration when REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is REVERSE

Value Units: ratio
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.0000	1.0000

Initial Supporting table - P17C5 P17D3 intermediate speed sensor RPM

Description: P17C5 P17D3 intermediate speed sensor RPM at signal period transtion to enable fail time update

Value Units: intermediate speed sensor RPM
X Unit: intermediate speed sensor 1 or 2

y/x	CeTNSR_e_InternalSpdSnsr1	CeTNSR_e_InternalSpdSnsr2	CeTNSR_e_InternalSpdSnsr3
1	25	25	25

Initial Supporting table - transmission fluid temperature warm up time

Description:

Value Units: transmission fluid temperature normal warn up time, seconds
X Unit: transmission fluid temperature at controller power up, °C

y/x	-40.00	-30.00	-20.00	0.00	20.00
1	1,800.0	1,500.0	1,200.0	600.0	60.0

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - ETRS Mode Valve A turbine delay

Description: ETRS Mode Valve A turbine delay

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - ETRS Mode Valve B turbine delay

Description: ETRS Mode Valve B turbine delay

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - intermediate speed sensor 1 or 2 predicted direction

Description: intermediate speed sensor 1 or 2 predicted direction

Value Units: predicted direction: forward, reverse, unknown
X Unit: attained gear
Y Units: intermediate speed sensor 1 or 2

intermediate speed sensor 1 or 2 predicted direction - Part 1			
y/x	CeCGSR_e_CR_NullForSched	CeCGSR_e_CR_Neutral	CeCGSR_e_CR_Park
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 2			
y/x	CeCGSR_e_CR_Reverse	CeCGSR_e_CR_First	CeCGSR_e_CR_Second
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionReverse	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 3			
y/x	CeCGSR_e_CR_Third	CeCGSR_e_CR_Fourth	CeCGSR_e_CR_Fifth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionForward
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 4			
y/x	CeCGSR_e_CR_Sixth	CeCGSR_e_CR_Seventh	CeCGSR_e_CR_Eighth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 5			
y/x	CeCGSR_e_CR_Ninth	CeCGSR_e_CR_Tenth	
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	

Initial Supporting table - P176B delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Description: delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.000	1.000

Initial Supporting table - P176B holding clutch states

Description: inditaces when the clutch states allow transmission intermediate speed sensor evaluation, when rotating components can trigger speed sesnor, holding clutches will not allow evaluation while clutches not holding will allow evaluation

Value Units: TRUE or FALSE
X Unit: intermediate speed sensor select
Y Units: commanded gear

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
CeCGSR_e_CR_NullForSched	1	1
CeCGSR_e_CR_Neutral	1	1
CeCGSR_e_CR_Park	1	1
CeCGSR_e_CR_Reverse	0	1
CeCGSR_e_CR_First	0	1
CeCGSR_e_CR_Second	0	1
CeCGSR_e_CR_Third	1	1
CeCGSR_e_CR_Fourth	0	1
CeCGSR_e_CR_Fifth	0	1
CeCGSR_e_CR_Sixth	0	1
CeCGSR_e_CR_Seventh	1	1
CeCGSR_e_CR_Eighth	0	1
CeCGSR_e_CR_Ninth	0	1
CeCGSR_e_CR_Tenth	1	1

Initial Supporting table - P176B intermediate speed sensor fail count threshold

Description: P176B intermediate speed sensor fail count threshold

Value Units: fail counts
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	4	4

Initial Supporting table - P176B intermediate speed sensor fail time threshold

Description: P176B intermediate speed sensor fail time threshold

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	2.000	2.000

Initial Supporting table - P176B minimum estimated transmission intermediate speed to enable fail evaluation

Description: minimum estimated transmission intermediate speed to enable fail evaluation, where estimate is based on transmission input speed / ratio calibration, where ratio calibration is either P176B ratio calibration when REVERSE or P176B ratio calibration when not REVERSE

Value Units: estimated transmission intermediate speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B minimum transmission input speed to enable fail evaluation

Description: minimum transmission input speed to enable fail evaluation

Value Units: transmission input speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B ratio calibration when not REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is not REVERSE

Value Units: ratio
X Unit: commanded gear
Y Units: intermediate speed sensor select

y/x	CeTGRR_e_Gear1	CeTGRR_e_Gear2	CeTGRR_e_Gear3	CeTGRR_e_Gear4	CeTGRR_e_Gear5	CeTGRR_e_Gear6	CeTGRR_e_Gear7	CeTGRR_e_Gear8	CeTGRR_e_Gear9	CeTGRR_e_Gear10
CeTSRR_e_C2C_ClchSpdSnsr1	1.5848	6.3694	1.0000	1.0000	0.5227	1.0000	1.0000	1.1905	1.0000	1.0000
CeTSRR_e_C2C_ClchSpdSnsr2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P176B ratio calibration when REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is REVERSE

Value Units: ratio
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.0000	1.0000

Initial Supporting table - P17C5 P17D3 intermediate speed sensor RPM

Description: P17C5 P17D3 intermediate speed sensor RPM at signal period transtion to enable fail time update

Value Units: intermediate speed sensor RPM
X Unit: intermediate speed sensor 1 or 2

y/x	CeTNSR_e_InternalSpdSnsr1	CeTNSR_e_InternalSpdSnsr2	CeTNSR_e_InternalSpdSnsr3
1	25	25	25

Initial Supporting table - P2817 TCC stuck off fail TCC slip speed

Description: TCC stuck off slip speed fail threshold when TCC is in ON mode (controlled slip mode)

Value Units: RPM
X Unit: engine torque Nm

y/x	0.00	64.00	128.00	192.00	256.00	320.00	384.00	448.00	512.00
1	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

Initial Supporting table - P2818 (GF9 specific) control valve test time

Description: Value to initialize the torque converter clutch control valve test time to after clutch select valve solenoid is turned on, window of time in which the torque converter clutch slip speed and derivative slip speed must be evaluated for failure. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	0.600	0.300	0.100

Initial Supporting table - P2818 stuck on test time

Description: Value to initialize the TCC Stuck On test time to after transition of clutch select valve allowing TCC hydraulic circuit connectivity. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	1.500	1.250	1.000

Initial Supporting table - transmission fluid temperature warm up time

Description:

Value Units: transmission fluid temperature normal warn up time, seconds
X Unit: transmission fluid temperature at controller power up, °C

y/x	-40.00	-30.00	-20.00	0.00	20.00
1	1,800.0	1,500.0	1,200.0	600.0	60.0

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - ETRS Mode Valve A turbine delay

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - ETRS Mode Valve B turbine delay

Description: ETRS Mode Valve B turbine delay

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - intermediate speed sensor 1 or 2 predicted direction

Description: intermediate speed sensor 1 or 2 predicted direction

Value Units: predicted direction: forward, reverse, unknown
X Unit: attained gear
Y Units: intermediate speed sensor 1 or 2

intermediate speed sensor 1 or 2 predicted direction - Part 1			
y/x	CeCGSR_e_CR_NullForSched	CeCGSR_e_CR_Neutral	CeCGSR_e_CR_Park
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 2			
y/x	CeCGSR_e_CR_Reverse	CeCGSR_e_CR_First	CeCGSR_e_CR_Second
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionReverse	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 3			
y/x	CeCGSR_e_CR_Third	CeCGSR_e_CR_Fourth	CeCGSR_e_CR_Fifth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionForward
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 4			
y/x	CeCGSR_e_CR_Sixth	CeCGSR_e_CR_Seventh	CeCGSR_e_CR_Eighth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 5			
y/x	CeCGSR_e_CR_Ninth	CeCGSR_e_CR_Tenth	
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	

Initial Supporting table - Mode Valve A Eng Off Dly Lim

Description: used for both engine off mode valve A stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.100	6.100	6.100	3.100	1.300

Initial Supporting table - Mode Valve A Eng Off ML Lim

Description: Mode Valve A transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded. Temp based.

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Mode Valve A Final State

Description: mode valve A position

Value Units: mode valve position
X Unit: ETRS diagnostic range
Y Units: ETRS command direction

Mode Valve A Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveLow		
5	CePSCR_e_ModeValveHigh		
6	CePSCR_e_ModeValveLow		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Valve B Eng Off Dly Lim

Description: used for both engine off mode valve B stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius

y/x	-40	-20	0	20	130
1	3.000	2.400	2.000	1.000	0.500

Initial Supporting table - Mode Valve B Eng Off ML Lim

Description: Mode Valve B transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded. Temp based.

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Mode Valve B Final State

Description: mode valve B position

Value Units: mode valve B position
X Unit: ETRS diagnostic range

Mode Valve B Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveHigh		
5	CePSCR_e_ModeValveLow		
6	CePSCR_e_ModeValveHigh		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Vlv StdySt Park Dly Lim

Description: fail delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1	4.000	0.731	0.244	0.244	0.244

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	7.800	6.000	3.300	0.444	0.119

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.569	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.462	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.100	2.100	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.231	1.800	0.875	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.837	1.150	0.688	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.381	0.863	0.644	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	2.069	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.725	0.688	0.344	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.931	0.481	0.344	0.137	0.113

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.369	0.344

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.369	0.344

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.181	0.163

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - P171D hydraulic pressure delay

Description: Time to delay the initial x of y counter due to hydraulic transients. Thresholds are a function of transmission fluid temperature. Horizontal axis is transmission fluid temperature (DegC) and table output is delay time (seconds).

Value Units: delay time seconds
X Unit: transmission fluid temperature DegC

y/x	-40	0	20	30	40	50	60
1	0.090	0.090	0.080	0.050	0.050	0.050	0.050

Initial Supporting table - P171D predicted turbine speed error

Description: Predicted turbine speed vs actual turbine speed error. Thresholds are a function of engine speed and transmission fliud temperature. Diagnostic is considered failing above these values. Table vertical axis is engine speed (RPM), horizontal axis is transmission fluid temperature (DegC) and table output is predicted turbine speed error (RPM).

Value Units: turbine speed RPM error
X Unit: transmission fluid temperature DegC
Y Units: engine speed RPM

y/x	-40	0	10	20	40
0	300	300	300	300	300
500	300	300	300	300	300
1,100	300	300	300	300	300
1,500	300	300	300	300	300
2,500	300	300	300	300	300

Initial Supporting table - P176B delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Description: delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.000	1.000

Initial Supporting table - P176B holding clutch states

Description: inditaces when the clutch states allow transmission intermediate speed sensor evaluation, when rotating components can trigger speed sesnor, holding clutches will not allow evaluation while clutches not holding will allow evaluation

Value Units: TRUE or FALSE
X Unit: intermediate speed sensor select
Y Units: commanded gear

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
CeCGSR_e_CR_NullForSched	1	1
CeCGSR_e_CR_Neutral	1	1
CeCGSR_e_CR_Park	1	1
CeCGSR_e_CR_Reverse	0	1
CeCGSR_e_CR_First	0	1
CeCGSR_e_CR_Second	0	1
CeCGSR_e_CR_Third	1	1
CeCGSR_e_CR_Fourth	0	1
CeCGSR_e_CR_Fifth	0	1
CeCGSR_e_CR_Sixth	0	1
CeCGSR_e_CR_Seventh	1	1
CeCGSR_e_CR_Eighth	0	1
CeCGSR_e_CR_Ninth	0	1
CeCGSR_e_CR_Tenth	1	1

Initial Supporting table - P176B intermediate speed sensor fail count threshold

Description: P176B intermediate speed sensor fail count threshold

Value Units: fail counts
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	4	4

Initial Supporting table - P176B intermediate speed sensor fail time threshold

Description: P176B intermediate speed sensor fail time threshold

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	2.000	2.000

Initial Supporting table - P176B minimum estimated transmission intermediate speed to enable fail evaluation

Description: minimum estimated transmission intermediate speed to enable fail evaluation, where estimate is based on transmission input speed / ratio calibration, where ratio calibration is either P176B ratio calibration when REVERSE or P176B ratio calibration when not REVERSE

Value Units: estimated transmission intermediate speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B minimum transmission input speed to enable fail evaluation

Description: minimum transmission input speed to enable fail evaluation

Value Units: transmission input speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B ratio calibration when not REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is not REVERSE

Value Units: ratio
X Unit: commanded gear
Y Units: intermediate speed sensor select

y/x	CeTGRR_e_Gear1	CeTGRR_e_Gear2	CeTGRR_e_Gear3	CeTGRR_e_Gear4	CeTGRR_e_Gear5	CeTGRR_e_Gear6	CeTGRR_e_Gear7	CeTGRR_e_Gear8	CeTGRR_e_Gear9	CeTGRR_e_Gear10
CeTSRR_e_C2C_ClchSpdSnsr1	1.5848	6.3694	1.0000	1.0000	0.5227	1.0000	1.0000	1.1905	1.0000	1.0000
CeTSRR_e_C2C_ClchSpdSnsr2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P176B ratio calibration when REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is REVERSE

Value Units: ratio
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.0000	1.0000

Initial Supporting table - P17C5 P17D3 intermediate speed sensor RPM

Description: P17C5 P17D3 intermediate speed sensor RPM at signal period transtion to enable fail time update

Value Units: intermediate speed sensor RPM
X Unit: intermediate speed sensor 1 or 2

y/x	CeTNSR_e_InternalSpdSnsr1	CeTNSR_e_InternalSpdSnsr2	CeTNSR_e_InternalSpdSnsr3
1	25	25	25

Initial Supporting table - P2817 TCC stuck off fail TCC slip speed

Description: TCC stuck off slip speed fail threshold when TCC is in ON mode (controlled slip mode)

Value Units: RPM
X Unit: engine torque Nm

y/x	0.00	64.00	128.00	192.00	256.00	320.00	384.00	448.00	512.00
1	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

Initial Supporting table - P2818 (GF9 specific) control valve test time

Description: Value to initialize the torque converter clutch control valve test time to after clutch select valve solenoid is turned on, window of time in which the torque converter clutch slip speed and derivative slip speed must be evaluated for failure. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	0.600	0.300	0.100

Initial Supporting table - P2818 stuck on test time

Description: Value to initialize the TCC Stuck On test time to after transition of clutch select valve allowing TCC hydraulic circuit connectivity. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	1.500	1.250	1.000

Initial Supporting table - Park Valve Stk On Dly Lim

Description: P187D Transmission Park Valve Stuck On fail enable delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1.00	3.500	2.700	0.500	0.250	0.250

Initial Supporting table - Park Valve Stk On Fail Lim

Description: Fail timer limit for Park servo to Move from P to OOP Temp based

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - transmission fluid temperature warm up time

Description:

Value Units: transmission fluid temperature normal warn up time, seconds
X Unit: transmission fluid temperature at controller power up, °C

y/x	-40.00	-30.00	-20.00	0.00	20.00
1	1,800.0	1,500.0	1,200.0	600.0	60.0

Initial Supporting table - C1 exhaust delay closed throttle down shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C1 exhaust delay closed throttle lift foot up shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.200	2.000	0.950	0.850	0.850

Initial Supporting table - C1 exhaust delay garage shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C1 exhaust delay negative torque up shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C1 exhaust delay open throttle power down shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C1 exhaust delay open throttle power on up shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.200	2.000	0.950	0.850	0.850

Initial Supporting table - C1_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C1 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-1	-1	-1	-1

Initial Supporting table - C2 exhaust delay closed throttle down shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.700	0.600

Initial Supporting table - C2 exhaust delay garage shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C2 exhaust delay negative torque up shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C2 exhaust delay open throttle power down shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.212	0.212

Initial Supporting table - C2 exhaust delay open throttle power on up shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.100	1.100	0.950	0.850	0.850

Initial Supporting table - C2_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C2 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-2	-1	-1	0

Initial Supporting table - C3 exhaust delay closed throttle down shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.000	2.500	1.800	0.650	0.600

Initial Supporting table - C3 exhaust delay closed throttle lift foot up shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.900	1.100	0.950	0.900	0.900

Initial Supporting table - C3 exhaust delay garage shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C3 exhaust delay negative torque up shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C3 exhaust delay open throttle power down shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.387	0.144

Initial Supporting table - C3 exhaust delay open throttle power on up shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.900	1.100	0.950	0.900	0.900

Initial Supporting table - C3_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C3 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-1	-1	-1	-1	-1

Initial Supporting table - C4 exhaust delay closed throttle down shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.400	0.900	0.700	0.663	0.600

Initial Supporting table - C4 exhaust delay closed throttle lift foot up shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.900	1.100	0.950	0.850	0.850

Initial Supporting table - C4 exhaust delay garage shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C4 exhaust delay negative torque up shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C4 exhaust delay open throttle power down shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.119	0.119

Initial Supporting table - C4 exhaust delay open throttle power on up shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.900	1.100	0.950	0.850	0.850

Initial Supporting table - C4_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C4 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-1	-1	-1	-1

Initial Supporting table - C5 exhaust delay closed throttle down shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.000	2.000	1.750	1.400	1.400

Initial Supporting table - C5 exhaust delay closed throttle lift foot up shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.500	2.300	1.100	0.850	0.850

Initial Supporting table - C5 exhaust delay garage shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	2	1	1	1	1

Initial Supporting table - C5 exhaust delay negative torque up shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C5 exhaust delay open throttle power down shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.900	0.613	0.450	0.300	0.163

Initial Supporting table - C5 exhaust delay open throttle power on up shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.500	2.300	1.100	0.850	0.850

Initial Supporting table - C5_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C5 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-1	-1	-1	-1

Initial Supporting table - C6 exhaust delay closed throttle lift foot up shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C6 exhaust delay garage shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C6 exhaust delay negative torque up shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C6 exhaust delay open throttle power down shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.850	0.350	0.300	0.238	0.131

Initial Supporting table - C6 exhaust delay open throttle power on up shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C6_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C6 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-1	-1	-1	-1

Initial Supporting table - Clutch Clip Press GS Shifts

Description: Oncoming clutch clip pressure for garage shifts

Value Units: kPa
X Unit: Oncoming Clutch

y/x	CeTSER_e_C1_Clutch	CeTSER_e_C2_Clutch	CeTSER_e_C3_Clutch	CeTSER_e_C4_Clutch	CeTSER_e_C5_Clutch	CeTSER_e_C6_Clutch
1	750	750	750	750	750	750

Initial Supporting table - Clutch Clip Press NU Shifts

Description: Oncoming clutch clip pressure for negative torque up shifts

Value Units: kPa
X Unit: Oncoming Clutch

y/x	CeTSER_e_C1_Clutch	CeTSER_e_C2_Clutch	CeTSER_e_C3_Clutch	CeTSER_e_C4_Clutch	CeTSER_e_C5_Clutch	CeTSER_e_C6_Clutch
1	690	800	500	850	703	655

Initial Supporting table - Clutch Clip Press PD Shifts

Description: Oncoming clutch clip pressure for open throttle power down shifts

Value Units: kPa
X Unit: Oncoming Clutch

y/x	CeTSER_e_C1_Clutch	CeTSER_e_C2_Clutch	CeTSER_e_C3_Clutch	CeTSER_e_C4_Clutch	CeTSER_e_C5_Clutch	CeTSER_e_C6_Clutch
1	400	800	500	850	703	655

Initial Supporting table - Clutch Stuck On Fail Offset Time CD Shifts

Description: Used for closed throttle down shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time GS Shifts

Description: Used for garage shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time NU Shifts

Description: Used for negative torque up shifts to add additional fail time based on oil temperature

X Unit: transmission fluid temperature °C
Y Units: time (seconds)

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time PD Shifts

Description: Used for open throttle power down shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	1	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time PU Shifts

Description: Used for powered up shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time STGR Shifts

Description: Used for clutch staging shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Shift Type Enable

Description: Calibration to enable the clutch stuck on test for each shift type

XUnit: Shift Type
Y Units: Boolean

y/x	CeTSER_e_STGR	CeTSER_e_GSCR	CeTSER_e_NUCR	CeTSER_e_PUCR	CeTSER_e_CDCR	CeTSER_e_PDCR	CeTSER_e_CLAR
1	0	0	1	1	1	1	0

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - ETRS Mode Valve A turbine delay

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - ETRS Mode Valve B turbine delay

Description: ETRS Mode Valve B turbine delay

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - intermediate speed sensor 1 or 2 predicted direction

Description: intermediate speed sensor 1 or 2 predicted direction

Value Units: predicted direction: forward, reverse, unknown
X Unit: attained gear
Y Units: intermediate speed sensor 1 or 2

intermediate speed sensor 1 or 2 predicted direction - Part 1			
y/x	CeCGSR_e_CR_NullForSched	CeCGSR_e_CR_Neutral	CeCGSR_e_CR_Park
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 2			
y/x	CeCGSR_e_CR_Reverse	CeCGSR_e_CR_First	CeCGSR_e_CR_Second
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionReverse	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 3			
y/x	CeCGSR_e_CR_Third	CeCGSR_e_CR_Fourth	CeCGSR_e_CR_Fifth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionForward
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 4			
y/x	CeCGSR_e_CR_Sixth	CeCGSR_e_CR_Seventh	CeCGSR_e_CR_Eighth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 5			
y/x	CeCGSR_e_CR_Ninth	CeCGSR_e_CR_Tenth	
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	

Initial Supporting table - Mode Valve A Eng Off Dly Lim

Description: used for both engine off mode valve A stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.100	6.100	6.100	3.100	1.300

Initial Supporting table - Mode Valve A Final State

Description: mode valve A position

Value Units: mode valve position
X Unit: ETRS diagnostic range
Y Units: ETRS command direction

Mode Valve A Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveLow		
5	CePSCR_e_ModeValveHigh		
6	CePSCR_e_ModeValveLow		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Valve B Eng Off Dly Lim

Description: used for both engine off mode valve B stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius

y/x	-40	-20	0	20	130
1	3.000	2.400	2.000	1.000	0.500

Initial Supporting table - Mode Valve B Final State

Description: mode valve B position

Value Units: mode valve B position
X Unit: ETRS diagnostic range

Mode Valve B Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveHigh		
5	CePSCR_e_ModeValveLow		
6	CePSCR_e_ModeValveHigh		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Vlv StdySt Park Dly Lim

Description: fail delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1	4.000	0.731	0.244	0.244	0.244

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	7.800	6.000	3.300	0.444	0.119

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.569	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.462	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.100	2.100	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.231	1.800	0.875	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.837	1.150	0.688	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.381	0.863	0.644	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	2.069	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.725	0.688	0.344	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.931	0.481	0.344	0.137	0.113

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.369	0.344

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.369	0.344

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

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Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.181	0.163

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - P171D hydraulic pressure delay

Description: Time to delay the initial x of y counter due to hydraulic transients. Thresholds are a function of transmission fluid temperature. Horizontal axis is transmission fluid temperature (DegC) and table output is delay time (seconds).

Value Units: delay time seconds
X Unit: transmission fluid temperature DegC

y/x	-40	0	20	30	40	50	60
1	0.090	0.090	0.080	0.050	0.050	0.050	0.050

Initial Supporting table - P171D predicted turbine speed error

Description: Predicted turbine speed vs actual turbine speed error. Thresholds are a function of engine speed and transmission fliud temperature. Diagnostic is considered failing above these values. Table vertical axis is engine speed (RPM), horizontal axis is transmission fluid temperature (DegC) and table output is predicted turbine speed error (RPM).

Value Units: turbine speed RPM error
X Unit: transmission fluid temperature DegC
Y Units: engine speed RPM

y/x	-40	0	10	20	40
0	300	300	300	300	300
500	300	300	300	300	300
1,100	300	300	300	300	300
1,500	300	300	300	300	300
2,500	300	300	300	300	300

Initial Supporting table - P176B delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Description: delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.000	1.000

Initial Supporting table - P176B holding clutch states

Description: inditaces when the clutch states allow transmission intermediate speed sensor evaluation, when rotating components can trigger speed sesnor, holding clutches will not allow evaluation while clutches not holding will allow evaluation

Value Units: TRUE or FALSE
X Unit: intermediate speed sensor select
Y Units: commanded gear

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
CeCGSR_e_CR_NullForSched	1	1
CeCGSR_e_CR_Neutral	1	1
CeCGSR_e_CR_Park	1	1
CeCGSR_e_CR_Reverse	0	1
CeCGSR_e_CR_First	0	1
CeCGSR_e_CR_Second	0	1
CeCGSR_e_CR_Third	1	1
CeCGSR_e_CR_Fourth	0	1
CeCGSR_e_CR_Fifth	0	1
CeCGSR_e_CR_Sixth	0	1
CeCGSR_e_CR_Seventh	1	1
CeCGSR_e_CR_Eighth	0	1
CeCGSR_e_CR_Ninth	0	1
CeCGSR_e_CR_Tenth	1	1

Initial Supporting table - P176B intermediate speed sensor fail count threshold

Description: P176B intermediate speed sensor fail count threshold

Value Units: fail counts
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	4	4

Initial Supporting table - P176B intermediate speed sensor fail time threshold

Description: P176B intermediate speed sensor fail time threshold

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	2.000	2.000

Initial Supporting table - P176B minimum estimated transmission intermediate speed to enable fail evaluation

Description: minimum estimated transmission intermediate speed to enable fail evaluation, where estimate is based on transmission input speed / ratio calibration, where ratio calibration is either P176B ratio calibration when REVERSE or P176B ratio calibration when not REVERSE

Value Units: estimated transmission intermediate speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B minimum transmission input speed to enable fail evaluation

Description: minimum transmission input speed to enable fail evaluation

Value Units: transmission input speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B ratio calibration when not REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is not REVERSE

Value Units: ratio
X Unit: commanded gear
Y Units: intermediate speed sensor select

y/x	CeTGRR_e_Gear1	CeTGRR_e_Gear2	CeTGRR_e_Gear3	CeTGRR_e_Gear4	CeTGRR_e_Gear5	CeTGRR_e_Gear6	CeTGRR_e_Gear7	CeTGRR_e_Gear8	CeTGRR_e_Gear9	CeTGRR_e_Gear10
CeTSRR_e_C2C_ClchSpdSnsr1	1.5848	6.3694	1.0000	1.0000	0.5227	1.0000	1.0000	1.1905	1.0000	1.0000
CeTSRR_e_C2C_ClchSpdSnsr2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P176B ratio calibration when REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is REVERSE

Value Units: ratio
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.0000	1.0000

Initial Supporting table - P17C5 P17D3 intermediate speed sensor RPM

Description: P17C5 P17D3 intermediate speed sensor RPM at signal period transtion to enable fail time update

Value Units: intermediate speed sensor RPM
X Unit: intermediate speed sensor 1 or 2

y/x	CeTNSR_e_InternalSpdSnsr1	CeTNSR_e_InternalSpdSnsr2	CeTNSR_e_InternalSpdSnsr3
1	25	25	25

Initial Supporting table - P2817 TCC stuck off fail TCC slip speed

Description: TCC stuck off slip speed fail threshold when TCC is in ON mode (controlled slip mode)

Value Units: RPM
X Unit: engine torque Nm

y/x	0.00	64.00	128.00	192.00	256.00	320.00	384.00	448.00	512.00
1	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

Initial Supporting table - P2818 (GF9 specific) control valve test time

Description: Value to initialize the torque converter clutch control valve test time to after clutch select valve solenoid is turned on, window of time in which the torque converter clutch slip speed and derivative slip speed must be evaluated for failure. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	0.600	0.300	0.100

Initial Supporting table - P2818 stuck on test time

Description: Value to initialize the TCC Stuck On test time to after transition of clutch select valve allowing TCC hydraulic circuit connectivity. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	1.500	1.250	1.000

Initial Supporting table - Park Valve Stk On Dly Lim

Description: P187D Transmission Park Valve Stuck On fail enable delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1.00	3.500	2.700	0.500	0.250	0.250

Initial Supporting table - speed sensor directional rationality enable calibration

Description: speed sensor directional rationality enable calibration

Value Units: Boolean
X Unit: scheduled gear
Y Units: unitless

y/x	CeCGSR_FwdCmded	CeCGSR_NeutCmded	CeCGSR_RvrsCmded	CeCGSR-ParkCmded
1	1	0	0	0

Initial Supporting table - transmission fluid temperature warm up time

Description:

Value Units: transmission fluid temperature normal warn up time, seconds
X Unit: transmission fluid temperature at controller power up, °C

y/x	-40.00	-30.00	-20.00	0.00	20.00
1	1,800.0	1,500.0	1,200.0	600.0	60.0

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - intermediate speed sensor 1 or 2 predicted direction

Description: intermediate speed sensor 1 or 2 predicted direction

Value Units: predicted direction: forward, reverse, unknown
X Unit: attained gear
Y Units: intermediate speed sensor 1 or 2

intermediate speed sensor 1 or 2 predicted direction - Part 1			
y/x	CeCGSR_e_CR_NullForSched	CeCGSR_e_CR_Neutral	CeCGSR_e_CR_Park
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 2			
y/x	CeCGSR_e_CR_Reverse	CeCGSR_e_CR_First	CeCGSR_e_CR_Second
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionReverse	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 3			
y/x	CeCGSR_e_CR_Third	CeCGSR_e_CR_Fourth	CeCGSR_e_CR_Fifth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionForward
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 4			
y/x	CeCGSR_e_CR_Sixth	CeCGSR_e_CR_Seventh	CeCGSR_e_CR_Eighth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 5			
y/x	CeCGSR_e_CR_Ninth	CeCGSR_e_CR_Tenth	
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	

Initial Supporting table - P0723 (MY21) transmission engaged state time threshold

Description: time necessary after transmission engaged state indicates transmsision engaged to allow P0723 enable

Value Units: seconds
seconds

y/x	-40	0	40
1	5	3	1

Initial Supporting table - P0723 Wheel Speed Calc

Description:

y/x	200	300	400	500	600
1	190	200	200	250	300

Initial Supporting table - P176B delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Description: delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.000	1.000

Initial Supporting table - P176B holding clutch states

Description: inditaces when the clutch states allow transmission intermediate speed sensor evaluation, when rotating components can trigger speed sesnor, holding clutches will not allow evaluation while clutches not holding will allow evaluation

Value Units: TRUE or FALSE
X Unit: intermediate speed sensor select
Y Units: commanded gear

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
CeCGSR_e_CR_NullForSched	1	1
CeCGSR_e_CR_Neutral	1	1
CeCGSR_e_CR_Park	1	1
CeCGSR_e_CR_Reverse	0	1
CeCGSR_e_CR_First	0	1
CeCGSR_e_CR_Second	0	1
CeCGSR_e_CR_Third	1	1
CeCGSR_e_CR_Fourth	0	1
CeCGSR_e_CR_Fifth	0	1
CeCGSR_e_CR_Sixth	0	1
CeCGSR_e_CR_Seventh	1	1
CeCGSR_e_CR_Eighth	0	1
CeCGSR_e_CR_Ninth	0	1
CeCGSR_e_CR_Tenth	1	1

Initial Supporting table - P176B intermediate speed sensor fail count threshold

Description: P176B intermediate speed sensor fail count threshold

Value Units: fail counts
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	4	4

Initial Supporting table - P176B intermediate speed sensor fail time threshold

Description: P176B intermediate speed sensor fail time threshold

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	2.000	2.000

Initial Supporting table - P176B minimum estimated transmission intermediate speed to enable fail evaluation

Description: minimum estimated transmission intermediate speed to enable fail evaluation, where estimate is based on transmission input speed / ratio calibration, where ratio calibration is either P176B ratio calibration when REVERSE or P176B ratio calibration when not REVERSE

Value Units: estimated transmission intermediate speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B minimum transmission input speed to enable fail evaluation

Description: minimum transmission input speed to enable fail evaluation

Value Units: transmission input speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B ratio calibration when not REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is not REVERSE

Value Units: ratio
X Unit: commanded gear
Y Units: intermediate speed sensor select

y/x	CeTGRR_e_Gear1	CeTGRR_e_Gear2	CeTGRR_e_Gear3	CeTGRR_e_Gear4	CeTGRR_e_Gear5	CeTGRR_e_Gear6	CeTGRR_e_Gear7	CeTGRR_e_Gear8	CeTGRR_e_Gear9	CeTGRR_e_Gear10
CeTSRR_e_C2C_ClchSpdSnsr1	1.5848	6.3694	1.0000	1.0000	0.5227	1.0000	1.0000	1.1905	1.0000	1.0000
CeTSRR_e_C2C_ClchSpdSnsr2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P176B ratio calibration when REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is REVERSE

Value Units: ratio
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.0000	1.0000

Initial Supporting table - P17C5 P17D3 intermediate speed sensor RPM

Description: P17C5 P17D3 intermediate speed sensor RPM at signal period transtion to enable fail time update

Value Units: intermediate speed sensor RPM
X Unit: intermediate speed sensor 1 or 2

y/x	CeTNSR_e_InternalSpdSnsr1	CeTNSR_e_InternalSpdSnsr2	CeTNSR_e_InternalSpdSnsr3
1	25	25	25

Initial Supporting table - P2817 TCC stuck off fail TCC slip speed

Description: TCC stuck off slip speed fail threshold when TCC is in ON mode (controlled slip mode)

Value Units: RPM
X Unit: engine torque Nm

y/x	0.00	64.00	128.00	192.00	256.00	320.00	384.00	448.00	512.00
1	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

Initial Supporting table - P2818 (GF9 specific) control valve test time

Description: Value to initialize the torque converter clutch control valve test time to after clutch select valve solenoid is turned on, window of time in which the torque converter clutch slip speed and derivative slip speed must be evaluated for failure. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	0.600	0.300	0.100

Initial Supporting table - P2818 stuck on test time

Description: Value to initialize the TCC Stuck On test time to after transition of clutch select valve allowing TCC hydraulic circuit connectivity. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	1.500	1.250	1.000

Initial Supporting table - speed sensor directional rationality enable calibration

Description: speed sensor directional rationality enable calibration

Value Units: Boolean
X Unit: scheduled gear
Y Units: unitless

y/x	CeCGSR_FwdCmded	CeCGSR_NeutCmded	CeCGSR_RvrsCmded	CeCGSR-ParkCmded
1	1	0	0	0

Initial Supporting table - transmission fluid temperature warm up time

Description:

Value Units: transmission fluid temperature normal warn up time, seconds
X Unit: transmission fluid temperature at controller power up, °C

y/x	-40.00	-30.00	-20.00	0.00	20.00
1	1,800.0	1,500.0	1,200.0	600.0	60.0

Initial Supporting table - Binary Clutch C1 FEM Neutral Release Thresh

Description:

Value Units: Time (sec)
X Unit: Transmission Oil Temperature (deg C)

y/x	-30	-15	0	10	20	40	80	110	140
1	0	0	0	0	0	0	0	0	0

Initial Supporting table - Binary Clutch C1 Neutral Release Time Out

Description:

Value Units: Time (sec)
X Unit: Transmission Oil Temperature (deg C)

y/x	-30	-15	0	10	20	40	80	110	140
1	0	0	0	0	0	0	0	0	0

Initial Supporting table - Binary Clutch C1 Slip Threshold

Description:

Value Units: RPM
X Unit: Transmission Oil Temperature (deg C)

y/x	-30	-15	0	10	20	40	80	110	140
1	50	50	50	50	50	50	50	50	50

Initial Supporting table - Binary Clutch Cold Inhibit Thresh

Description: Transmission Oil temperature above which SOWC can be commanded on

Value Units: Temperature
X Unit: Gear Selection Mode

y/x	CeCGSI_e_TFT_NormMode	CeCGSI_e_TFT_TUTD_Mode
1	40	15

Initial Supporting table - Binary Clutch Neutral Release Time Out

Description:

Value Units: Time (sec)
X Unit: Transmission Oil Temperature (deg C)

y/x	-30	-15	0	10	20	40	80	110	140
1	2	2	2	2	2	2	2	2	2

Initial Supporting table - C1 Coasting Downshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C1 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	300
1	681	681	681	681	681

Initial Supporting table - C1 exhaust delay closed throttle down shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C1 exhaust delay closed throttle lift foot up shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.200	2.000	0.950	0.850	0.850

Initial Supporting table - C1 exhaust delay garage shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C1 exhaust delay negative torque up shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C1 exhaust delay open throttle power down shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C1 exhaust delay open throttle power on up shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.200	2.000	0.950	0.850	0.850

Initial Supporting table - C1 Powered Upshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C1 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	500
1	2,100	2,100	2,100	2,100	2,100

Initial Supporting table - C1_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C1 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-1	-1	-1	-1

Initial Supporting table - C2 Coasting Downshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C2 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	300
1	525	525	525	525	525

Initial Supporting table - C2 exhaust delay closed throttle down shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.700	0.600

Initial Supporting table - C2 exhaust delay garage shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C2 exhaust delay negative torque up shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C2 exhaust delay open throttle power down shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.212	0.212

Initial Supporting table - C2 exhaust delay open throttle power on up shift

Description: P0777 C2 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.100	1.100	0.950	0.850	0.850

Initial Supporting table - C2 Powered Upshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C2 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	500
1	550	681	813	1,075	1,863

Initial Supporting table - C2_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C2 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-2	-1	-1	0

Initial Supporting table - C3 Coasting Downshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C3 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	300
1	363	363	363	363	363

Initial Supporting table - C3 exhaust delay closed throttle down shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.000	2.500	1.800	0.650	0.600

Initial Supporting table - C3 exhaust delay closed throttle lift foot up shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.900	1.100	0.950	0.900	0.900

Initial Supporting table - C3 exhaust delay garage shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C3 exhaust delay negative torque up shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C3 exhaust delay open throttle power down shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.387	0.144

Initial Supporting table - C3 exhaust delay open throttle power on up shift

Description: P0797 C3 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.900	1.100	0.950	0.900	0.900

Initial Supporting table - C3 Powered Upshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C3 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	500
1	438	569	694	950	1,713

Initial Supporting table - C3_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C3 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-1	-1	-1	-1	-1

Initial Supporting table - C4 Coasting Downshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C4 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	300
1	463	463	463	463	463

Initial Supporting table - C4 exhaust delay closed throttle down shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.400	0.900	0.700	0.663	0.600

Initial Supporting table - C4 exhaust delay closed throttle lift foot up shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.900	1.100	0.950	0.850	0.850

Initial Supporting table - C4 exhaust delay garage shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C4 exhaust delay negative torque up shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C4 exhaust delay open throttle power down shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.119	0.119

Initial Supporting table - C4 exhaust delay open throttle power on up shift

Description: P2715 C4 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.900	1.100	0.950	0.850	0.850

Initial Supporting table - C4 Powered Upshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C4 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	500
1	338	469	600	856	1,638

Initial Supporting table - C4_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C4 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-1	-1	-1	-1

Initial Supporting table - C5 Coasting Downshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C5 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	300
1	356	356	356	356	356

Initial Supporting table - C5 exhaust delay closed throttle down shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in closed throttle down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.000	2.000	1.750	1.400	1.400

Initial Supporting table - C5 exhaust delay closed throttle lift foot up shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.500	2.300	1.100	0.850	0.850

Initial Supporting table - C5 exhaust delay garage shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	2	1	1	1	1

Initial Supporting table - C5 exhaust delay negative torque up shift

Description: P0747 C1 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C5 exhaust delay open throttle power down shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.900	0.613	0.450	0.300	0.163

Initial Supporting table - C5 exhaust delay open throttle power on up shift

Description: P2724 C5 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	3.500	2.300	1.100	0.850	0.850

Initial Supporting table - C5 Powered Upshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C5 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	500
1	569	756	944	1,319	2,431

Initial Supporting table - C5_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C5 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-1	-1	-1	-1

Initial Supporting table - C6 Coasting Downshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C6 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	300
1	655	655	655	655	655

Initial Supporting table - C6 exhaust delay closed throttle lift foot up shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in closed throttle lift foot up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C6 exhaust delay garage shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in garage shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C6 exhaust delay negative torque up shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in negative torque up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.500	0.500	0.500	0.500	0.500

Initial Supporting table - C6 exhaust delay open throttle power down shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in open throttle power down shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	0.850	0.350	0.300	0.238	0.131

Initial Supporting table - C6 exhaust delay open throttle power on up shift

Description: P2733 C6 clutch hydraulic circuit exhaust time in open throttle power on up shift

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-20.00	0.00	30.00	110.00
1	1.600	1.100	0.950	0.850	0.850

Initial Supporting table - C6 Powered Upshift Tq Based Pres Clip

Description:

Value Units: Clutch Pressure (kPa)
X Unit: C6 Oncoming Clutch Torque (Nm)

y/x	0	50	100	200	500
1	506	588	669	825	1,306

Initial Supporting table - C6_Oncoming Post-Torque Phase Delay

Description: Post torque phase delay before calculating oncoming clutch clip pressure for powered upshifts when C6 is the oncoming clutch

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	-2	-1	-1	-1	-1

Initial Supporting table - Clutch Clip Press GS Shifts

Description: Oncoming clutch clip pressure for garage shifts

Value Units: kPa
X Unit: Oncoming Clutch

y/x	CeTSER_e_C1_Clutch	CeTSER_e_C2_Clutch	CeTSER_e_C3_Clutch	CeTSER_e_C4_Clutch	CeTSER_e_C5_Clutch	CeTSER_e_C6_Clutch
1	750	750	750	750	750	750

Initial Supporting table - Clutch Clip Press NU Shifts

Description: Oncoming clutch clip pressure for negative torque up shifts

Value Units: kPa
X Unit: Oncoming Clutch

y/x	CeTSER_e_C1_Clutch	CeTSER_e_C2_Clutch	CeTSER_e_C3_Clutch	CeTSER_e_C4_Clutch	CeTSER_e_C5_Clutch	CeTSER_e_C6_Clutch
1	690	800	500	850	703	655

Initial Supporting table - Clutch Clip Press PD Shifts

Description: Oncoming clutch clip pressure for open throttle power down shifts

Value Units: kPa
X Unit: Oncoming Clutch

y/x	CeTSER_e_C1_Clutch	CeTSER_e_C2_Clutch	CeTSER_e_C3_Clutch	CeTSER_e_C4_Clutch	CeTSER_e_C5_Clutch	CeTSER_e_C6_Clutch
1	400	800	500	850	703	655

Initial Supporting table - Clutch Stuck On Fail Offset Time CD Shifts

Description: Used for closed throttle down shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time GS Shifts

Description: Used for garage shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time NU Shifts

Description: Used for negative torque up shifts to add additional fail time based on oil temperature

X Unit: transmission fluid temperature °C
Y Units: time (seconds)

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time PD Shifts

Description: Used for open throttle power down shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	1	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time PU Shifts

Description: Used for powered up shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Fail Offset Time STGR Shifts

Description: Used for clutch staging shifts to add additional fail time based on oil temperature

Value Units: time (seconds)
X Unit: transmission fluid temperature °C

y/x	-40	-20	0	30	110
1	0	0	0	0	0

Initial Supporting table - Clutch Stuck On Shift Type Enable

Description: Calibration to enable the clutch stuck on test for each shift type

XUnit: Shift Type
Y Units: Boolean

y/x	CeTSER_e_STGR	CeTSER_e_GSCR	CeTSER_e_NUCR	CeTSER_e_PUCR	CeTSER_e_CDCR	CeTSER_e_PDCR	CeTSER_e_CLAR
1	0	0	1	1	1	1	0

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - ETRS Mode Valve A turbine delay

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - ETRS Mode Valve B turbine delay

Description: ETRS Mode Valve B turbine delay

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - Mode Enable Valve Test Delay Lim

Description: Test Delay for turbine speed

Value Units: Seconds
X Unit: Transmission fluid temp, Deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Valve A Eng Off Dly Lim

Description: used for both engine off mode valve A stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.100	6.100	6.100	3.100	1.300

Initial Supporting table - Mode Valve A Eng Off ML Lim

Description: Mode Valve A transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded. Temp based.

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Mode Valve A Fail Lim

Description: Mode valve A fail limit after delay has matured

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Valve A Final State

Description: mode valve A position

Value Units: mode valve position
X Unit: ETRS diagnostic range
Y Units: ETRS command direction

Mode Valve A Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveLow		
5	CePSCR_e_ModeValveHigh		
6	CePSCR_e_ModeValveLow		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Valve A Steady State Fail Lim

Description: Mode Valve A steady state sensor fault fail limit

Value Units: Seconds
X Unit: Transmissin fluid temp, deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Valve B Eng Off Dly Lim

Description: used for both engine off mode valve B stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius

y/x	-40	-20	0	20	130
1	3.000	2.400	2.000	1.000	0.500

Initial Supporting table - Mode Valve B Eng Off ML Lim

Description: Mode Valve B transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded. Temp based.

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Mode Valve B Fail Lim

Description: Mode valve B fail limit after delay has matured

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Valve B Final State

Description: mode valve B position

Value Units: mode valve B position
X Unit: ETRS diagnostic range

Mode Valve B Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveHigh		
5	CePSCR_e_ModeValveLow		
6	CePSCR_e_ModeValveHigh		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Valve B Steady State Fail Lim

Description: Mode Valve B steady state fail limit

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Vlv StdySt Park Dly Lim

Description: fail delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1	4.000	0.731	0.244	0.244	0.244

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	7.800	6.000	3.300	0.444	0.119

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.569	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.462	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.100	2.100	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.231	1.800	0.875	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.837	1.150	0.688	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.381	0.863	0.644	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	2.069	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.725	0.688	0.344	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description: Mode Valve B transition delay from NeutShf to Drive

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	2	0	0	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description: Mode Valve B transition delay from NeutShf to NeutHi

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	1	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description: Mode Valve B transition delay from NeutShf to NeutLo

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	3	2	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description: Mode Valve B transition delay from NeutShf to Park

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	3	2	1	0	0

Initial Supporting table - ModeVIvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description: Mode Valve B transsition delay from NeutShf to Rvrs

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	1	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description: Mode Valve B transition delay from Park to Drive

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	1	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description: Mode Valve B Transition delay from Park to NeutHi

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	7	6	1	1	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description: Mode Valve B transition delay from Park to NeutLo

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	7	6	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutShf]

Description: Mode Valve B transition from Park to NeutShf

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	7	6	1	1	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description: Mode Valve B transition delay from Park to Reverse

Value Units: Seconds
X Unit: Trasnmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	7	6	1	1	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description: Mode Valve B transition delay Reverse to Drive

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	2	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description: Mode Valve B transtion delay Reverse to NeutLo

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	2	1	1	0	0

Initial Supporting table - ModeVIvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description: Mode Valve B transition delay [Rvrs][NeutShf]

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	1	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description: Mode valve A transition delay timer for Reverse to Park

Value Units: seconds
X Unit: transmission fluid tep, deg C

y/x	-40	-20	0	20	130
1	2	1	1	0	0

Initial Supporting table - P2817 TCC stuck off fail TCC slip speed

Description: TCC stuck off slip speed fail threshold when TCC is in ON mode (controlled slip mode)

Value Units: RPM
X Unit: engine torque Nm

y/x	0.00	64.00	128.00	192.00	256.00	320.00	384.00	448.00	512.00
1	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

Initial Supporting table - P2818 (GF9 specific) control valve test time

Description: Value to initialize the torque converter clutch control valve test time to after clutch select valve solenoid is turned on, window of time in which the torque converter clutch slip speed and derivative slip speed must be evaluated for failure. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	0.600	0.300	0.100

Initial Supporting table - P2818 GF9 Establish crash slip limit

Description: RPM limit used to establish slip crashed when TCC oil became available

Value Units: RPM
X Unit: percent

y/x	0	15	25	50	75
1	100	100	160	233	300

Initial Supporting table - P2818 GF9 1 TCC Stuck On Crash Decel limit

Description: TCC slopip decel limit to establish slip crashed when TCC oil became available for TCC Stuck On diagnostics

Value Units: RPM per Second
X Unit: transmission fluid temperature °C
Y Units: percent

y/x	-7	10	40
0	-600	-600	-600
15	-600	-600	-600
25	-900	-900	-900
50	-1,200	-1,200	-1,200
75	-1,500	-1,500	-1,500

Initial Supporting table - P2818 stuck on test time

Description: Value to initialize the TCC Stuck On test time to after transition of clutch select valve allowing TCC hydraulic circuit connectivity. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	1.500	1.250	1.000

Initial Supporting table - Park Servo Stk On Delay Lim

Description: Delay timer limit for Park servo to Move from P to OOP

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	4	3	1	0	0

Initial Supporting table - Park Valve Stuck Off Fail Lim

Description: Fail timer limit for Park Servo to move from OOP to P. Temp based .

Value Units: Seconds
X Unit: Transmission fluid temp Deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Park Vlv Stk Off Dly Lim

Description: Delay timer limit for Park Servo to move from OOP to P

Value Units: Seconds
X Unit: Trasnmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	2	1	1	1	1

Initial Supporting table - Park Vlv Stk Off Eng Off Lim

Description: Park Servo transition delay timer when engine is off

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	3	3	2	1	1

Initial Supporting table - Park Vlv Stk Off ML Eng Off Lim

Description: Park Servo transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded.

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Park Vlv Stk Off ZL DLy Lim

Description: Delay timer limit for Park Servo to move from OOP to P Temp based.
* Only used when ZeroLimit is active to set Park Servo Stuck Off.

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	6	6	3	1	1

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - P2817 TCC stuck off fail TCC slip speed

Description: TCC stuck off slip speed fail threshold when TCC is in ON mode (controlled slip mode)

Value Units: RPM
X Unit: engine torque Nm

y/x	0.00	64.00	128.00	192.00	256.00	320.00	384.00	448.00	512.00
1	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

Initial Supporting table - P2818 (GF9 specific) control valve test time

Description: Value to initialize the torque converter clutch control valve test time to after clutch select valve solenoid is turned on, window of time in which the torque converter clutch slip speed and derivative slip speed must be evaluated for failure. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	0.600	0.300	0.100

Initial Supporting table - P2818 GF9 Establish crash slip limit

Description: RPM limit used to establish slip crashed when TCC oil became available

Value Units: RPM
X Unit: percent

y/x	0	15	25	50	75
1	100	100	160	233	300

Initial Supporting table - P2818 GF9 TCC Stuck On Crash Decel limit

Description: TCC slopip decel limit to establish slip crashed when TCC oil became available for TCC Stuck On diagnostics

Value Units: RPM per Second
X Unit: transmission fluid temperature °C
Y Units: percent

y/x	-7	10	40
0	-600	-600	-600
15	-600	-600	-600
25	-900	-900	-900
50	-1,200	-1,200	-1,200
75	-1,500	-1,500	-1,500

Initial Supporting table - P2818 stuck on test time

Description: Value to initialize the TCC Stuck On test time to after transition of clutch select valve allowing TCC hydraulic circuit connectivity. Window is a time down window from the calibration value to zero (0.0) seconds.

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	1.500	1.250	1.000

Initial Supporting table - engine speed time for transmission hydraulic pressure available

Description: time needed for engine speed to trigger "transmission hydraulic pressure available"

Value Units: seconds
X Unit: transmission fluid temperature °C

y/x	-40.00	-30.00	-20.00	0.00	40.00
1	0.300	0.300	0.275	0.200	0.200

Initial Supporting table - intermediate speed sensor 1 or 2 predicted direction

Description: intermediate speed sensor 1 or 2 predicted direction

Value Units: predicted direction: forward, reverse, unknown
X Unit: attained gear
Y Units: intermediate speed sensor 1 or 2

intermediate speed sensor 1 or 2 predicted direction - Part 1			
y/x	CeCGSR_e_CR_NullForSched	CeCGSR_e_CR_Neutral	CeCGSR_e_CR_Park
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 2			
y/x	CeCGSR_e_CR_Reverse	CeCGSR_e_CR_First	CeCGSR_e_CR_Second
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionReverse	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 3			
y/x	CeCGSR_e_CR_Third	CeCGSR_e_CR_Fourth	CeCGSR_e_CR_Fifth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionForward
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 4			
y/x	CeCGSR_e_CR_Sixth	CeCGSR_e_CR_Seventh	CeCGSR_e_CR_Eighth
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionForward	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionReverse
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown
intermediate speed sensor 1 or 2 predicted direction - Part 5			
y/x	CeCGSR_e_CR_Ninth	CeCGSR_e_CR_Tenth	
CeTSRR_e_C2C_ClchSpdSnsr1	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	
CeTSRR_e_C2C_ClchSpdSnsr2	CeTNSR_e_DirectionUnknown	CeTNSR_e_DirectionUnknown	

Initial Supporting table - P176B delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Description: delay to allow transmission input, intermediate and output speeds to stablize for fail evaluation

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.000	1.000

Initial Supporting table - P176B holding clutch states

Description: inditaces when the clutch states allow transmission intermediate speed sensor evaluation, when rotating components can trigger speed sesnor, holding clutches will not allow evaluation while clutches not holding will allow evaluation

Value Units: TRUE or FALSE
X Unit: intermediate speed sensor select
Y Units: commanded gear

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
CeCGSR_e_CR_NullForSched	1	1
CeCGSR_e_CR_Neutral	1	1
CeCGSR_e_CR_Park	1	1
CeCGSR_e_CR_Reverse	0	1
CeCGSR_e_CR_First	0	1
CeCGSR_e_CR_Second	0	1
CeCGSR_e_CR_Third	1	1
CeCGSR_e_CR_Fourth	0	1
CeCGSR_e_CR_Fifth	0	1
CeCGSR_e_CR_Sixth	0	1
CeCGSR_e_CR_Seventh	1	1
CeCGSR_e_CR_Eighth	0	1
CeCGSR_e_CR_Ninth	0	1
CeCGSR_e_CR_Tenth	1	1

Initial Supporting table - P176B intermediate speed sensor fail count threshold

Description: P176B intermediate speed sensor fail count threshold

Value Units: fail counts
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	4	4

Initial Supporting table - P176B intermediate speed sensor fail time threshold

Description: P176B intermediate speed sensor fail time threshold

Value Units: seconds
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	2.000	2.000

Initial Supporting table - P176B minimum estimated transmission intermediate speed to enable fail evaluation

Description: minimum estimated transmission intermediate speed to enable fail evaluation, where estimate is based on transmission input speed / ratio calibration, where ratio calibration is either P176B ratio calibration when REVERSE or P176B ratio calibration when not REVERSE

Value Units: estimated transmission intermediate speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B minimum transmission input speed to enable fail evaluation

Description: minimum transmission input speed to enable fail evaluation

Value Units: transmission input speed RPM
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	172.0	172.0

Initial Supporting table - P176B ratio calibration when not REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is not REVERSE

Value Units: ratio
X Unit: commanded gear
Y Units: intermediate speed sensor select

y/x	CeTGRR_e_Gear1	CeTGRR_e_Gear2	CeTGRR_e_Gear3	CeTGRR_e_Gear4	CeTGRR_e_Gear5	CeTGRR_e_Gear6	CeTGRR_e_Gear7	CeTGRR_e_Gear8	CeTGRR_e_Gear9	CeTGRR_e_Gear10
CeTSRR_e_C2C_ClchSpdSnsr1	1.5848	6.3694	1.0000	1.0000	0.5227	1.0000	1.0000	1.1905	1.0000	1.0000
CeTSRR_e_C2C_ClchSpdSnsr2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P176B ratio calibration when REVERSE

Description: used to estimate transmission input speed based on transmission intermediate speed when range is REVERSE

Value Units: ratio
X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	1.0000	1.0000

Initial Supporting table - P17C5 P17D3 intermediate speed sensor RPM

Description: P17C5 P17D3 intermediate speed sensor RPM at signal period transtion to enable fail time update

Value Units: intermediate speed sensor RPM
X Unit: intermediate speed sensor 1 or 2

y/x	CeTNSR_e_InternalSpdSnsr1	CeTNSR_e_InternalSpdSnsr2	CeTNSR_e_InternalSpdSnsr3
1	25	25	25

Initial Supporting table - speed sensor directional rationality enable calibration

Description: speed sensor directional rationality enable calibration

Value Units: Boolean
X Unit: scheduled gear
Y Units: unitless

y/x	CeCGSR_FwdCmded	CeCGSR_NeutCmded	CeCGSR_RvrsCmded	CeCGSR-ParkCmded
1	1	0	0	0

Initial Supporting table - transmission fluid temperature warm up time

Description:

Value Units: transmission fluid temperature normal warn up time, seconds
X Unit: transmission fluid temperature at controller power up, °C

y/x	-40.00	-30.00	-20.00	0.00	20.00
1	1,800.0	1,500.0	1,200.0	600.0	60.0

Initial Supporting table - ETRS Mode Valve A turbine delay

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - ETRS Mode Valve B turbine delay

Description: ETRS Mode Valve B turbine delay

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - Mode Valve A Eng Off Dly Lim

Description: used for both engine off mode valve A stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.100	6.100	6.100	3.100	1.300

Initial Supporting table - Mode Valve A Eng Off ML Lim

Description: Mode Valve A transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded. Temp based.

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Mode Valve A Final State

Description: mode valve A position

Value Units: mode valve position
X Unit: ETRS diagnostic range
Y Units: ETRS command direction

Mode Valve A Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveLow		
5	CePSCR_e_ModeValveHigh		
6	CePSCR_e_ModeValveLow		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Valve B Eng Off Dly Lim

Description: used for both engine off mode valve B stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius

y/x	-40	-20	0	20	130
1	3.000	2.400	2.000	1.000	0.500

Initial Supporting table - Mode Valve B Eng Off ML Lim

Description: Mode Valve B transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded. Temp based.

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Mode Valve B Final State

Description: mode valve B position

Value Units: mode valve B position
X Unit: ETRS diagnostic range

Mode Valve B Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveHigh		
5	CePSCR_e_ModeValveLow		
6	CePSCR_e_ModeValveHigh		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Vlv StdySt Park Dly Lim

Description: fail delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1	4.000	0.731	0.244	0.244	0.244

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	7.800	6.000	3.300	0.444	0.119

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.569	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.462	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.100	2.100	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.231	1.800	0.875	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.837	1.150	0.688	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.381	0.863	0.644	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	2.069	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.725	0.688	0.344	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.931	0.481	0.344	0.137	0.113

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.369	0.344

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.369	0.344

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.181	0.163

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - Park Valve Stk On Dly Lim

Description: P187D Transmission Park Valve Stuck On fail enable delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1.00	3.500	2.700	0.500	0.250	0.250

Initial Supporting table - Park Valve Stk On Fail Lim

Description: Fail timer limit for Park servo to Move from P to OOP Temp based

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - ETRS Mode Valve A turbine delay

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - ETRS Mode Valve B turbine delay

Description: ETRS Mode Valve B turbine delay

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.300	1.800	1.000	0.500	0.300

Initial Supporting table - Mode Enable Valve Test Delay Lim

Description: Test Delay for turbine speed

Value Units: Seconds
X Unit: Transmission fluid temp, Deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Valve A Eng Off Dly Lim

Description: used for both engine off mode valve A stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.100	6.100	6.100	3.100	1.300

Initial Supporting table - Mode Valve A Eng Off ML Lim

Description: Mode Valve A transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded. Temp based.

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Mode Valve A Fail Lim

Description: Mode valve A fail limit after delay has matured

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Valve A Final State

Description: mode valve A position

Value Units: mode valve position
X Unit: ETRS diagnostic range
Y Units: ETRS command direction

Mode Valve A Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
5	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
6	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve A Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveLow		
5	CePSCR_e_ModeValveHigh		
6	CePSCR_e_ModeValveLow		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Valve A Steady State Fail Lim

Description: Mode Valve A steady state sensor fault fail limit

Value Units: Seconds
X Unit: Transmissin fluid temp, deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Valve B Eng Off Dly Lim

Description: used for both engine off mode valve B stability delay time required to enable fail time update and fail time threshold

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius

y/x	-40	-20	0	20	130
1	3.000	2.400	2.000	1.000	0.500

Initial Supporting table - Mode Valve B Eng Off ML Lim

Description: Mode Valve B transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded. Temp based.

Value Units: Seconds
X Unit: Degrees C
Y Units: unitless

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Mode Valve B Fail Lim

Description: Mode valve B fail limit after delay has matured

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Mode Valve B Final State

Description: mode valve B position

Value Units: mode valve B position
X Unit: ETRS diagnostic range

Mode Valve B Final State - Part 1

y/x	1	2	3
1		CeSTGR_e_ETRS_Park	CeSTGR_e_ETRS_NeutLo
2	CeSTGR_e_ETRS_Park	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CeSTGR_e_ETRS_NeutLo	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CeSTGR_e_ETRS_NeutHi	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CeSTGR_e_ETRS_Drive	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CeSTGR_e_ETRS_Rvrs	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CeSTGR_e_ETRS_NeutShf	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 2

y/x	4	5	6
1	CeSTGR_e_ETRS_NeutHi	CeSTGR_e_ETRS_Drive	CeSTGR_e_ETRS_Rvrs
2	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
3	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
4	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
5	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow	CePSCR_e_ModeValveLow
6	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh
7	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh	CePSCR_e_ModeValveHigh

Mode Valve B Final State - Part 3

y/x	7		
1	CeSTGR_e_ETRS_NeutShf		
2	CePSCR_e_ModeValveLow		
3	CePSCR_e_ModeValveLow		
4	CePSCR_e_ModeValveHigh		
5	CePSCR_e_ModeValveLow		
6	CePSCR_e_ModeValveHigh		
7	CePSCR_e_ModeValveHigh		

Initial Supporting table - Mode Valve B Steady State Fail Lim

Description: Mode Valve B steady state fail limit

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - mode valve fail time

Description: mode valve fail time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1	6.000	2.000	1.500	1.000	1.000

Initial Supporting table - Mode Vlv StdySt Park Dly Lim

Description: fail delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1	4.000	0.731	0.244	0.244	0.244

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	7.800	6.000	3.300	0.444	0.119

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transimssion fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.569	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	6.900	4.600	1.150	0.462	0.413

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.100	2.100	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.231	1.800	0.875	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	3.450	2.069	0.688	0.413	0.369

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.837	1.150	0.688	0.113	0.069

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.381	0.863	0.644	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	2.125	1.100	0.688	0.250	0.231

Initial Supporting table - ModeVlvA_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40	-20	0	20	130
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	3.450	2.069	0.762	0.369	0.344

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Park, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_FnlDly[ETRS attained range Reverse, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	2.069	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Drive, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutLo]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.725	0.688	0.344	0.163	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	2.331	0.950	0.512	0.212	0.137

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutHi, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Drive]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutHi]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range NeutShf]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Park]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	1.000	0.750	0.500	0.250	0.200

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutLo, ETRS command range Reverse]

Description:

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.0	-20.0	0.0	20.0	130.0
1	7.000	5.500	1.100	0.500	0.400

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Drive]

Description: Mode Valve B transition delay from NeutShf to Drive

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	2	0	0	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutHi]

Description: Mode Valve B transition delay from NeutShf to NeutHi

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	1	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range NeutLo]

Description: Mode Valve B transition delay from NeutShf to NeutLo

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	3	2	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Park]

Description: Mode Valve B transition delay from NeutShf to Park

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	3	2	1	0	0

Initial Supporting table - ModeVIvB_TrnstnDly[ETRS attained range NeutShf, ETRS command range Reverse]

Description: Mode Valve B transsition delay from NeutShf to Rvrs

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	1	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Drive]

Description: Mode Valve B transition delay from Park to Drive

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	1	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutHi]

Description: Mode Valve B Transition delay from Park to NeutHi

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	7	6	1	1	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutLo]

Description: Mode Valve B transition delay from Park to NeutLo

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	7	6	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range NeutShf]

Description: Mode Valve B transition from Park to NeutShf

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	7	6	1	1	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Park, ETRS command range Reverse]

Description: Mode Valve B transition delay from Park to Reverse

Value Units: Seconds
X Unit: Trasnmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	7	6	1	1	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Drive]

Description: Mode Valve B transition delay Reverse to Drive

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	2	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutLo]

Description: Mode Valve B transtion delay Reverse to NeutLo

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	2	1	1	0	0

Initial Supporting table - ModeVIvB_TrnstnDly[ETRS attained range Reverse, ETRS command range NeutShf]

Description: Mode Valve B transition delay [Rvrs][NeutShf]

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	1	1	1	0	0

Initial Supporting table - ModeVlvB_TrnstnDly[ETRS attained range Reverse, ETRS command range Park]

Description: Mode valve A transition delay timer for Reverse to Park

Value Units: seconds
X Unit: transmission fluid tep, deg C

y/x	-40	-20	0	20	130
1	2	1	1	0	0

Initial Supporting table - Park Servo Stk On Delay Lim

Description: Delay timer limit for Park servo to Move from P to OOP

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	4	3	1	0	0

Initial Supporting table - Park Valve Stk On Dly Lim

Description: P187D Transmission Park Valve Stuck On fail enable delay time

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1	3.500	2.700	0.500	0.250	0.250

Initial Supporting table - Park Valve Stk On Fail Lim

Description: Fail time for Park Servo to move from PARK to Out Of PARK

Value Units: seconds
X Unit: transmission fluid temperature, degrees Celsius
Y Units: unitless

y/x	-40.00	-20.00	0.00	20.00	130.00
1	0.250	0.250	0.250	0.250	0.250

Initial Supporting table - Park Valve Stuck Off Fail Lim

Description: Fail timer limit for Park Servo to move from OOP to P. Temp based .

Value Units: Seconds
X Unit: Transmission fluid temp Deg C

y/x	-40	-20	0	20	130
1	0	0	0	0	0

Initial Supporting table - Park Vlv Stk Off Dly Lim

Description: Delay timer limit for Park Servo to move from OOP to P

Value Units: Seconds
X Unit: Trasnmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	2	1	1	1	1

Initial Supporting table - Park Vlv Stk Off Eng Off Lim

Description: Park Servo transition delay timer when engine is off

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	3	3	2	1	1

Initial Supporting table - Park Vlv Stk Off ML Eng Off Lim

Description: Park Servo transition limit when the engine and one or more HSD's are off or when max line pressure is being commanded.

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	15	10	5	2	2

Initial Supporting table - Park Vlv Stk Off ZL DLy Lim

Description: Delay timer limit for Park Servo to move from OOP to P Temp based.
* Only used when ZeroLimit is active to set Park Servo Stuck Off.

Value Units: Seconds
X Unit: Transmission fluid temp, deg C

y/x	-40	-20	0	20	130
1	6	6	3	1	1