

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
System Voltage Performance	P0561	Detects a low performing 12V battery system. This diagnostic reports the DTC when the absolute value of the difference between the battery voltage and the run/crank voltage exceeds a calibrated value.	Run Crank voltage low and high	ABS(Battery voltage - Run Crank voltage) > 3.00	Battery voltage B+ line present = TRUE Battery voltage low and high diag enable = TRUE Run Crank voltage	1.00 1.00 Voltage ≥ 5.00 volts	40 failures out of 50 samples 100 ms / sample	Type A, 1 Trips

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Ignition Switch Run/ Start Position Circuit Low	P2534	Detects a low ignition switch run/start position circuit. This diagnostic reports the DTC when this circuit 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	280 failures out of 280 samples 25 ms / sample	Type A, 1 Trips

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Control Module Communicati on Bus A Off	U0073	This DTC monitors for a BUS A off condition	Bus off failures exceeds before the sample time of is reached	5 counts (equivalent to 0.06 seconds) 0.81 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 5.0000 seconds CAN hardware is bus OFF for	Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts > 0.1625 seconds	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

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Lost Communicati on With ECM	U0100	This DTC monitors for a loss of communication with the engine control module	Message is not received from controller for		General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management	Not Active on Current Key Cycle Enabled Not Active Not Active	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips
			Message \$0BE	≥ 0.50 seconds	Ignition Voltage Criteria:			
			Message \$0C9	≥ 12.00 seconds	Run/Crank Ignition voltage	> 6.41 Volts		
			Message \$18E	≥ 0.50 seconds	Power Mode	= run		
			Message \$1A1	≥ 12.00 seconds	Off Cycle Enable Criteria:			
			Message \$1A3	≥ 12.00 seconds	KeCAND_b_OffKeyCycle DiagEnbl	= 1 (1 indicates enabled)		
			Message \$1AA	≥ 12.00 seconds	Ignition Accessory Line and Battery Voltage	= Active > 11.00 Volts		
			Message \$1BA	≥ 0.50 seconds				
			Message \$287	≥ 0.50 seconds				
			Message \$3D1	≥ 12.00 seconds				
			Message \$3E9	≥ 12.00 seconds				
			Message \$4C1	≥ 12.00 seconds				
			Message \$4C7	≥ 12.00 seconds				
			Message \$4D1	≥ 12.00 seconds				
			Message \$4F1	≥ 12.00 seconds				
Message \$589	≥ 12.00 seconds	General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 5.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is						

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					not active for U0100 ECM	> 0.4000 seconds Not Active on Current Key Cycle is present on the bus		

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Lateral Acceleration Sensor Circuit Low	C124F	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.	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 Ω 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	Special Type C

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lateral Acceleration Sensor Circuit High	C1250	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.	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 ($\leq 0.5 \Omega$ 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	Special Type C

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Lateral Acceleration Sensor Performance	C1251	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.	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 stability time: TOSS vehicle speed automatic transmission is clutch to clutch OR dual clutch high side drive 1 enable high side drive 2 enable diagnotic 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 attained gear slip 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 = 1st thru 10th ≤ 100.0 RPM < 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	Special Type C

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Longitudinal Acceleration Sensor Circuit Low	C1252	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.	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 Ω 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	Special Type C

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Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Longitudinal Acceleration Sensor Circuit High	C1253	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.	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	$\geq 3.8500 \text{ g}$ $\leq 3.8500 \text{ g}$ ($\leq 0.5 \Omega$ 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	$\geq 11.00 \text{ volts}$ $\geq 11.00 \text{ volts}$ = 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	Special Type C

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					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 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 stability 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 diagnostic 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 attained gear slip ABS(raw longitudinal acceleration signal) AND ABS(raw longitudinal	≥ 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 = 1st thru 10th ≤ 100.0 RPM ≥ 0.5300 g ≤ 3.8500 g	raw lateral longitudinal acceleration signal stability time ≥ 30.0 seconds, fail time ≥ 75.0 seconds out of sample time ≥ 120.0 seconds, 50 millisecond update rate	

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					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	≤ 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 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 stability 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 diagnostic 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	≥ 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	raw lateral longitudinal acceleration signal stability time ≥ 30.0 seconds, fail time ≥ 75.0 seconds out of sample time ≥ 120.0 seconds, 50 millisecond update rate	

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P07BF test fail this key on P07C0 fault active P07C0test fail this key on attained gear attained gear slip ABS(raw longitudinal acceleration signal) AND ABS(raw longitudinal acceleration signal) 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	= FALSE = FALSE = FALSE = 1st thru 10th ≤ 100.0 RPM ≥ 0.5300 g ≤ 3.8500 g ≤ 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 1 fail time, 50 millisecond update rate	≥ 0.5300 g	battery voltage run crank voltage diagnostic monitor enable region 1 specific enable update raw lateral longitudinal acceleration signal stability time: TOSS vehicle speed TOSS vehicle speed acceleration automatic transmission is clutch to clutch OR dual	≥ 11.00 volts ≥ 11.00 volts = 1 Boolean = 0 Boolean ≥ 15.0 KPH ≤ 0.5300 g = TRUE	raw lateral longitudinal acceleration signal stability time ≥ 30.0 seconds, fail time ≥ 75.0 seconds out of sample time ≥ 120.0 seconds, 50 millisecond update rate	

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					clutch high side drive 1 enable high side drive 2 enable diagnosis 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 P07C0 test fail this key on attained gear attained gear slip 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 ABS(raw longitudinal acceleration signal) update sample time U0073 fault active U0073 test fail this key on DTCs not fault active	= TRUE = TRUE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1st thru 10th ≤ 100.0 RPM ≥ 0.5300 g ≤ 3.8500 g ≤ 0.70 % ≥ 80.0 Nm ≥ 0.1500 g ≥ 15.0 KPH ≤ 200.0 KPH < 0.5300 g = FALSE = FALSE VehicleSpeedSensor_FA VehicleSpeedSensorError	region 1 fail time ≥ 75.0 seconds out of region 1 sample time ≥ 120.0 seconds, 50 millisecond update rate	

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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.	
			The Primary Processor's calculated checksum does not match the stored checksum value for a selected subset of the calibrations.	2 consecutive failures detected or 5 total failures detected.			Diagnostic runs continuously. Will report a detected fault within 200 ms.	
			The Secondary 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.	
				In all cases, the failure count is cleared when controller shuts down				

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
TCM 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.	
			ECC ROM fault detected in NVM Flash region				Diagnostic runs at controller power up.	
			ECC ROM Error Count >	3				
			Perserved NVM region error detected during shut down.				Diagnostic runs at controller power down.	

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TCM RAM Failure	P0604	Indicates that the TCM 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 >=	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 >=	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 a mismatch between the data and dual data is found during RAM updates. Detects a mismatch in data and dual data updates >	400.00 s			When dual store updates occur.	

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			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)	
			Indicates that the secondary processor is unable to correctly read data from or write data to system 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)	

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Internal TCM Processor Integrity Fault	P0606	Indicates that the TCM 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 processors.	Loss or invalid message of SPI communication from the Secondary Processor at initialization detected by the Primary Processor or loss or invalid message of SPI communication from the Secondary Processor after a valid message was received by the Primary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was received		Run/Crank voltage >= 8.00 or Run/Crank voltage >= 11.00 , else the failure will be reported for all conditions	In the primary processor, 159 / 399 counts intermittent or 39 counts continuous; 39 counts continuous @ initialization. 12.5 ms /count in the TCM main processor	Type A, 1 Trips
			Loss or invalid message of SPI communication from the Primary Processor at initialization detected by the Secondary Processor or loss or invalid message of SPI communication from the Primary Processor after a valid message was received by the Secondary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was received			In the secondary processor, 64 / 161 counts intermittent or 0.1875 s continuous; 0.4875 s continuous @ initialization. 12.5 ms /count in the TCM secondary processor	
			Checks for stack over or underflow in secondary processor by looking for corruption of known pattern at stack boundaries. Checks number of stack over/ under flow since last powerup reset >=	5		KeMEMD_b_StackLimitTestEnbl == 1 Value of KeMEMD_b_StackLimitTestEnbl is: 1 . (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			MAIN processor is verified by responding to a seed sent from the secondary with a key response to secondary. Checks number of incorrect keys	2 incorrect seeds within 8 messages, 0.2000 seconds		ignition in Run or Crank	150 ms for one seed continually failing	

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			received > or Secondary processor has not received a new within time limit					
			Time new seed not received exceeded			always running	0.450 seconds	
			MAIN processor receives seed in wrong order			always running	3 / 17 counts intermittent. 50 ms/count in the TCM main processor	
			2 fails in a row in the Secondary processor's ALU check			KePISD_b_ALU_TestEnbl d == 1 Value of KePISD_b_ALU_TestEnbl d is: 1. (If 0, this test is disabled)	25 ms	
			2 fails in a row in the Secondary processor's configuration register masks versus known good data			KePISD_b_ConfigRegTestEnbl d == 1 Value of KePISD_b_ConfigRegTestEnbl d is: 1. (If 0, this test is disabled)	12.5 to 25 ms	
			Secondary processor detects an error in the toggling of a hardware discrete line controlled by the MAIN processor: number of discrete changes > = or < = over time window(50ms)	7 17		KePISD_b_MainCPU_SOH_FltEnbl d == 1 Value of KePISD_b_MainCPU_SOH_FltEnbl d is: 1. (If 0, this test is disabled) time from initialization >= 0.5000 seconds	50 ms	
			Software background task first pass time to complete exceeds			Run/Crank voltage > 6.41	35.000 seconds	

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			2 fails in a row in the MAIN processor's ALU check			KePISD_b_ALU_TestEnbl d == 1 Value of KePISD_b_ALU_TestEnbl d is: 1. (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			KePISD_b_ConfigRegTestEnbl == 1 Value of KePISD_b_ConfigRegTestEnbl is: 1. (If 0, this test is disabled)	12.5 to 25 ms	
			Checks number of stack over/under flow since last powerup reset >=	5		KeMEMD_b_StackLimitTestEnbl == 1 Value of KeMEMD_b_StackLimitTestEnbl is: 1. (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			Voltage deviation >	9.00		KePISD_b_A2D_CnvtrTestEnbl == 1 Value of KePISD_b_A2D_CnvtrTestEnbl is: 1. (If 0, this test is disabled)	5 / 10 counts or 0.150 seconds continuous; 50 ms/count in the TCM main processor	
			Checks for ECC (error correcting code) circuit test errors reported by the hardware for flash memory. Increments counter during controller initialization if ECC error occurred since last controller initialization. Counter >=	3 (results in MIL), 5 (results in MIL and remedial action)		KeMEMD_b_FlashECC_CktTestEnbl == 1 Value of KeMEMD_b_FlashECC_CktTestEnbl is: 1. (If 0, this test is disabled)	variable, depends on length of time to access flash with corrupted memory	
			Checks for ECC (error	3 (results in MIL),		KeMEMD_b_RAM_ECC_	variable,	

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			correcting code) circuit test errors reported by the hardware for RAM memory circuit. Increments counter during controller initialization if ECC error occurred since last controller initialization. Counter >=	5 (results in MIL and remedial action)		CktTestEnbl == 1 Value of KeMEMD_b_RAM_ECC_CktTestEnbl is: 1. (If 0, this test is disabled)	depends on length of time to write flash to RAM variable, depends on length of time to write flash to RAM	
			MAIN processor DMA transfer from Flash to RAM has 1 failure			KePISD_b_DMA_XferTestEnbl == 1 Value of KePISD_b_DMA_XferTestEnbl is: 0. (If 0, this test is disabled)	variable, depends on length of time to write flash to RAM	
			Safety critical software is not executed in proper order.	>= 1 incorrect sequence.		Table, f(Core, Loop Time). See supporting tables: P0606_Program Sequence Watch Enable f(Core, Loop Time) (If 0, this Loop Time 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 the TCM main processor	

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			MAIN processor determines a seed has not changed within a specified time period within the 50ms task.	Previous seed value equals current seed value.		KePISD_b_SeedUpdKey StorFltEnbl == 1 Value of KePISD_b_SeedUpdKey StorFltEnbl is: 1. (If 0, this test is disabled)	Table, f(Loop Time). See supporting tables: P0606_Last Seed Timeout f (Loop Time)	

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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 A, 1 Trips
			HWIO reports the assembly calibration integrity check has failed				Diagnostic runs at controller power up.	

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Actuator Supply Voltage Circuit Low	P0658	Controller specific output driver circuit diagnoses the high sided driver circuit 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.	$\leq 0.5 \Omega$ impedance between signal and controller ground	diagnostic monitor enable high side drive ON service mode \$04 not active service fast learn not active P0658 fault active P0658 test fail this key on	= 1 Boolean = TRUE = FALSE = FALSE	fail count ≥ 6 counts out of sample count $\geq 2,395$ counts 6.25 millisecond update rate	Type A, 1 Trips

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Transmission Range (TR) Switch Circuit Low Voltage	P0707	Diagnoses the internal range sensor circuit A and wiring for a ground short circuit fault using controller specific PWM duty cycle measurement thresholds.	<p>when PWM sensor type and PWM voltage direct conditional internal range sensor A PWM duty cycle</p> <p>when PWM sensor type and PWM voltage inverse conditional internal range sensor A PWM duty cycle</p> <p>Increment fail and sample time, update rate 25 milliseconds</p> <p>Controller specific PWM duty cycle thresholds are set to meet the following controller specification for a short to ground.</p>	<p>≤ 9.998 % duty cycle</p> <p>≥ 9.998 % duty cycle</p> <p>$\leq 0.5 \Omega$ impedance between signal and controller ground</p>	<p>diagnostic monitor enable battery voltage</p> <p>when sensor type is PWM duty cycle direct or inverse conditional for fail threshold is used conditional type check calibration</p>	<p>= 1 Boolean ≥ 9.00 volts</p> <p>= CeTRGD_e_VoltDirctProp</p>	<p>fail time ≥ 1.000 seconds out of sample time ≥ 1.500 seconds</p> <p>battery voltage time ≥ 1.000 seconds</p>	Type A, 1 Trips

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Range (TR) Switch Circuit High Voltage	P0708	Diagnoses the internal range sensor circuit A and wiring for a short to voltage circuit fault using controller specific PWM duty cycle measurement thresholds.	<p>when PWM sensor type and PWM voltage direct conditional internal range sensor A PWM duty cycle</p> <p>when PWM sensor type and PWM voltage inverse conditional internal range sensor A PWM duty cycle</p> <p>Increment fail and sample time, update rate 25 milliseconds</p> <p>Controller specific PWM duty cycle thresholds are set to meet the following controller specification for a short to power.</p>	<p>≥ 91.998 % duty cycle</p> <p>≤ 91.998 % duty cycle</p> <p>$\leq 0.5 \Omega$ impedance between signal and controller power</p>	<p>diagnostic monitor enable battery voltage</p> <p>when sensor type is PWM duty cycle direct or inverse conditional for fail threshold is used conditional type check calibration</p>	<p>= 1 Boolean</p> <p>≥ 9.00 volts</p> <p>= CeTRGD_e_VoltDirctProp</p>	<p>fail time ≥ 1.000 seconds</p> <p>out of sample time ≥ 1.500 seconds</p> <p>battery voltage time ≥ 1.000 seconds</p>	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 sensor, any intermittent signal that causes multiple unrealistic delta changes (intermittent faults) based on the raw transmission fluid temperature sensor, and, raw transmission fluid temperature sensor signal stuck in valid range.	raw transmission fluid temperature and the transmission fluid temperature warm up time has elapsed	≤ 15.0 °C	diagnostic monitor enable P0712 NOT fault active P0713 NOT fault active battery voltage run crank voltage warm up test enable TFT rationality diagnostic monitor enabled driver accelerator pedal position engine torque engine speed vehicle speed engine coolant temperature engine coolant temperature raw transmission fluid temperature raw transmission fluid temperature P2818 fault active P2818 test fail this key on DTCs not fault active	= 1 Boolean ≥ 9.00 volts ≥ 9.00 volts = 1 Boolean = VeTFSR_b_TFT_RatIEnbl ≥ 5.0 % ≥ 50.0 Nm ≥ 500.0 RPM ≥ 10.0 KPH ≥ -40.0 °C ≤ 150.0 °C ≥ -40.0 °C ≤ 150.0 °C = FALSE = FALSE	transmission fluid temperature warm up time ≥ transmission fluid temperature warm up time seconds battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	Type B, 2 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						EngineTorqueEstInaccurate AcceleratorPedalFailure CrankSensor_FA ECT_Sensor_FA VehicleSpeedSensor_FA		
			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 battery voltage	= 1 Boolean ≥ 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 propulsion system active	= 1 Boolean = TRUE		
			raw transmission fluid temperature - previous	≤ 0.0000 °C			fail time ≥ 300.0 seconds	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			raw transmission fluid temperature, update rate 100 milliseconds, update fail time		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 ≥ -40.0 °C ≤ 150.0 °C	battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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	$\leq 47.450 \Omega$	diagnostic monitor enable battery voltage run crank voltage run crank voltage in range time	= 1 Boolean ≥ 9.00 volts ≥ 9.00 volts	fail time ≥ 10.00 seconds out of sample time ≥ 12.00 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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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	$\geq 105,445.0 \Omega$	diagnostic monitor enable battery voltage run crank voltage run crank voltage in range time	= 1 Boolean ≥ 9.00 volts ≥ 9.00 volts	fail time ≥ 10.00 seconds out of fail time ≥ 12.00 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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 accumulated 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	≥ 850.0 RPM	service mode \$04 active diagnostic monitor enable P0717 test fail this key on P07BF test fail this key on P07C0 test fail this key on last valid raw transmission input speed OR valid raw transmission input speed (before drop event) last valid raw transmission input speed updates very 25 milliseconds when stability time complete as long as (delta 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 = 1 Boolean = FALSE = FALSE = FALSE ≥ 160.0 RPM ≥ 160.0 RPM ≤ 320.0 RPM > 160.0 RPM ≥ 254.0 RPM ≥ 5.0 % ≤ 8,191.9 Nm ≥ 30.0 Nm ≥ 400.0 RPM	fail time ≥ 1.500 seconds updated fail event count, fail event count ≥ 5 counts, 25 millisecond update rate raw transmission input speed time ≥ 2.00 seconds stability time ≥ 0.100 seconds engine speed time ≥	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not fault active	AcceleratorPedalFailure EngineTorqueEstInaccu rate	engine speed time for transmission hydraulic pressure available see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Input Speed Sensor Circuit Low Voltage	P0717	Detects no activity in raw transmission input speed signal RPM due to open circuit 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 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 < 425.0 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_Sevent h ≥ CeCGSR_e_CR_First OR ≥ 162.0 RPM ≤ CeCGSR_e_CR_Tenth attained gear raw transmission output speed) h	fail time ≥ 4.00 seconds run crank voltage time ≥ 25 milliseconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					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	≥ 162.0 RPM = FALSE = FALSE = 0 Boolean = 1 Boolean ≥ 400.0 RPM EngineTorqueEstInaccuracy	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 ≥ 25.0 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 caibration	= FALSE = 1 Boolean ≠ 0 counts = FALSE = FALSE ≥ 0.3994 seconds ≤ 0.3193 seconds < 0.2080 seconds > 0.1523 seconds < 0.0518 seconds > 0.0381 seconds < 0.3994 seconds > 0.3193 seconds = CeTOSR_e_Directional	fail time ≥ 3.500 seconds out of sample time ≥ 5.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Output Speed Sensor Circuit Low Voltage	P0722	Detects no activity in raw transmission output speed signal RPM due to open circuit 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_CR_Tenth > CeCGSR_e_CR_Four th	service mode \$04 active diagnostic monitor enable when neutral range occurs: (garage shift OR PRNDL OR PRNDL OR range inhibit state) AND (engine torque accelerator pedal position) 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	= FALSE = 1 Boolean ≠ COMPLETE = PARK = NEUTRAL ≠ no inhibit active ≥ 8,192.0 Nm ≥ 100.0 % ≥ CeCGSR_e_CR_First ≤ CeCGSR_e_CR_Tenth > CeCGSR_e_CR_Fourth ≥ 50.0 Nm > 30.0 Nm ≥ 5.0 % > 3.0 % ≤ CeCGSR_e_CR_Fourth ≥ 80.0 Nm > 50.0 Nm	fail time ≥ 5.00 seconds high gear OR fail time ≥ 3.50 seconds low gear	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					accelerator pedal position hysteresis high accelerator pedal position hysteresis low) TISS enable occurs when: (TISS speed select OR TISS/TOSS has single power supply calibration AND TISS AND TISS) OR (TISS speed select 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 (PTO enable calibration is TRUE AND PTO active) run crank voltage service fast learn active	≥ 8.0 % > 5.0 % = 1 Boolean = 0 Boolean ≤ 8,191.9 RPM ≥ 425.0 RPM ≠ 1 Boolean = 0.00 Boolean ≤ 8,191.9 RPM ≥ 3,500.0 RPM = FALSE = FALSE = FALSE = FALSE ≠ 1 Boolean = 1 Boolean = TRUE ≥ 5.00 volts = FALSE	run crank voltage time ≥ 25 milliseconds	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 accumulated 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.	4WD low fail threshold: delta raw transmission output speed OR NOT 4WD low fail threshold, update fail time, delta raw transmission output speed = raw transmission output speed previous loop - raw transmission output speed, 25 millisecond update rate	≥ 500.0 RPM ≥ 500.0 RPM	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 transmission engaged state time threshold see supporting tables 4WD low change time ≥ 3.0 seconds run crank voltage time ≥ 25 milliseconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					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 OR PRNDL OR PRNDL OR raw transmission output speed OR last valid raw transmission output speed determine if raw transmission input speed is stable: (raw transmission input speed - raw transmission input speed previous, 25 millisecond update AND raw transmission input speed) OR (TISS/TOSS has single power supply calibration AND raw transmission input speed)	= CeTRGR_e_PRNDL_Neu tral = CeTRGR_e_PRNDL_Tra nsitional1 N-D transitional = CeTRGR_e_PRNDL_Tra nsitional4 R-N transitional ≥ 250.0 RPM ≥ 250.0 RPM ≤ 4,095.9 RPM ≥ 160.0 RPM = 0 Boolean = 0.0 RPM	raw transmission input speed stability time ≥ 2.00 seconds no time required	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					select delta RPM fail threshold: (4WD low state AND \$WD low valid) select P0723 4WD TOSS delta fail threshold otherwise use P0723 TOSS delta fail threshold last valid raw transmission output speed OR valid raw transmission output speed (before drop event) last valid raw transmission output speed updates every 25 milliseconds when stability time complete as long as (delta delta raw transmission output speed AND raw transmission output speed) transmission hydraulic pressure available: engine speed DTCs not fault active	= TRUE = TRUE > 89.0 RPM > 89.0 RPM ≤ 140.0 RPM ≥ 89.0 RPM ≥ 400.0 RPM AcceleratorPedalFailure EngineTorqueEstInaccu te	raw transmission output speed time ≥ 2.00 seconds stability time ≥ 0.100 seconds engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Torque Converter Clutch (TCC) System Performance - GF9 specific	P0741	The GF9 diagnostic monitor detects the transmission torque converter control valve failed hydraulically on. The torque converter hydraulic control circuit is multiplexed with the transmission clutch select valve hydraulic control circuit, allowing for the torque converter control valve stuck on test to execute when the clutch select valve solenoid is commanded ON. When the clutch select valve solenoid is commanded ON as the vehicle speed decreases toward zero KPH, and, if the torque converter control valve is stuck on, the torque converter slip speed rate of change will have a large slope while decreasing toward zero RPM, and the torque converter slip speed will remain low near zero RPM. The GR10 diagnostic monitor detects	while control valve test time timing down: rate of change of torque convert slip speed = (ABS (current loop value torque convert slip speed - previous loop value torque convert slip speed) / 25 milliseconds) when clutch select valve solenoid multiplexed to TCC hydraulic AND torque convert slip speed = ABS(engine speed - transmission input shaft speed) THEN increment fail count 25 millisecond update rate	\geq P0741 torque convert derivative slip speed fail threshold see supporting tables \leq 250.0 RPM	diagnostic monitor enable (TCC stuck off enable OR TCC stuck on enable) hydraulic pressure available: engine speed service fast learn active battery voltage run crank voltage P281B falut active P281D falut active P281E falut active PRNDL PRNDL PRNDL transmission fluid temperature	= 1 Boolean = 1 Boolean = 1 Boolean \geq 400.0 RPM = FALSE \geq 9.00 volts \geq 9.00 volts = FALSE = FALSE = FALSE ≠ PARK ≠ NEUTRAL ≠ REVERSE \geq -6.66 °C	fail count \geq 4 counts 25 millisecond update rate engine speed time \geq engine speed time for transmission hydraulic pressure available see supporting table battery voltage time \geq 0.100 seconds run crank voltage time \geq 0.100 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					transmission fluid temperature accelerator pedal position accelerator pedal position vehicle speed vehicle speed TCC command mode break latch state (clutch select valve solenoid control) P0722 fault pending P0723 fault pending P0716 fault pending P0717 fault pending P07BF fault pending P07C0 fault pending (PTO active OR PTO disable calibration) transmission fluid temperature transmission fluid temperature engine torque engine torque P0741 test fail this key on vehicle speed engine speed engine speed accelerator pedal position 4WD low state (driver shift mode active OR driver shift mode calibration) (misfire requests TCC off OR misfire TCC off calibration) (clutch control solenoid stuck on OR solenoid stuck OFF intrusive shift active)	$\leq 130.00 \text{ }^{\circ}\text{C}$ $\geq 0.00 \text{ } \%$ $\leq 20.00 \text{ } \%$ $\geq 0.0 \text{ KPH}$ $\leq 45.0 \text{ KPH}$ = OFF \neq disabled (clutch select valve transitioning) = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1 Boolean $\geq -6.66 \text{ }^{\circ}\text{C}$ $\leq 130.00 \text{ }^{\circ}\text{C}$ $\geq 55.0 \text{ Nm}$ $\leq 800.0 \text{ Nm}$ = FALSE $\leq 45.0 \text{ KPH}$ $\geq 400.0 \text{ RPM}$ $\leq 5,500.0 \text{ RPM}$ $\leq 95.0 \text{ } \%$ = FALSE = FALSE = 0 Boolean = 0 Boolean = FALSE		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not fault active	AcceleratorPedalFailure EngineTorqueEstInaccu rate P0716, P0717, P07BF, P07C0 P0722, P0723, P077C, P077D		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 millisecond update	≥ 200.0 RPM	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	= 1 Boolean = 1 Boolean ≥ 9.00 volts = 0 Boolean = 0 Boolean ≥ 9.00 volts = TRUE Boolean = TRUE Boolean = FALSE Boolean = FALSE Boolean	fail time ≥ 3.00 seconds, update fail count, fail count ≥ 3 counts 6.25 millisecond update battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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			available: engine speed enable C1 clutch slip speed fail compare when: diagnostic clutch test C1 ((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 FASLE (startle mitigation) clutch steady state adaptive active transmission output shaft speed C1 clutch slip speed valid, all speed sesnors are functional for lever node clutch slip speed calculation accelerator pedal position engine speed diagnostic clutch test C1 set to HOLDING CLUTCH when: clutch solenoid test state	≥ 400.0 RPM = HOLDING CLUTCH = FALSE = TRUE ≠ initial startle mitigation gear = FALSE = 0 Boolean = FALSE ≥ 100.0 RPM = TRUE ≥ 2.00 % ≥ 1,500.0 RPM = NEUTRAL TEST	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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 C1 CB123456, or, GR10 C1 CB123456R, clutch pressure control solenoid.			<p>((startle mitigation active OR (startle mitigation active AND (startle mitigation gear)) (see startle mitigation active NOTE below) C1 clutch pressured map</p> <p>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</p> <p>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</p> <p>NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on</p>	<p>= FALSE = TRUE ≠ initial startle mitigation gear = mapped to line pressure, C1 clutch pressure has transtioned from off-applying-applied</p> <p>= TRUE ≠ range shift completed</p> <p>= 1 Boolean = forward gear OR = 0 Boolean = reverse gear = FALSE ≠ NEUTRAL TEST = range shift completed</p>	<p>initialize range shift complete time = 0.500 seconds, range shift complete time must time down to zero when range shift complete</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715 P2724 P2733 P2821 DTCs not fault pending DTCs not test fail this key on DTCs not fault active	P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0 P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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 a clutch pressure control solenoid stuck			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: engine speed transmission output shaft speed set solenoid stuck on test trigger to TRUE when: clutch pressure control solenoid stuck off stuck intrusive shift request startle mitigation active (see startle mitigation active NOTE below) clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) initialize active clutch controller (clutch control processing in process of sequencing clutches on	= TRUE Boolean = FALSE Boolean = FALSE Boolean ≥ 400.0 RPM ≥ 89.0 RPM = FALSE = FALSE ≠ TIE UP TEST TEST STATE ≠ TIE UP TEST HOLD = TRUE	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		on test is disabled. This diagnostic monitor is relative to the GF9 C1 CB123456, or, GR10 C1 CB123456R, clutch pressure control solenoid.			and off for auto trans shift) (shift type enable for staged steady state shift - shift in process when new shift type occurs - interrupted shift OR shift type enable for garage shift OR shift type enable for negative torque up shift OR shift type enable for open throttle power on up shift OR shift type enable for closed throttle down shift OR shift type enable for open throttle power down shift OR shift type enable for closed throttle lift foot up shift) OR clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) transition clutch controller active clutch controller (staged steady sate shift - shift not in process, no new shift type occuring, no interrupted shift) set clutch control solenoid test state to TIE UP TEST	= 0 Boolean = 0 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = TIE UP TEST TEST STATE = TIE UP TEST HOLD = TRUE ≠ staged steady state		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>TEST STATE when: solenoid stuck on test trigger current loop clutch control solenoid test state OR current loop clutch control solenoid test state (see clutch control solenoid test state NOTE below) range shift state solenoid stuck on test trigger additional off going clutch occurred</p> <p>(clutch control solenoid test state OR clutch control solenoid test state) (see clutch control solenoid test state NOTE below) diagnostic clutch test</p> <p>(C1 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable) OR C1 off going clutch pressure</p>	<p>= TRUE = TEST WAITING = TIE UP TEST HOLD ≠ range shift complete = TRUE = TRUE</p> <p>= TIE UP TEST TEST STATE = TIE UP TEST HOLD = OFF GOING CLUTCH TEST = TRUE</p> <p>= 1 Boolean</p> <p>≤ 350.0 kPa</p>	<p>for C1 off going clutch pressure time ≥ P0747 C1 clutch exhaust delay time closed throttle lift foot up shift OR</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					engine torque primary on coming clutch active primary on coming control state closed throttle lift foot up shift primary on coming clutch pressure OR open throttle power on up shift primary on coming clutch pressure OR garage shift primary on	≥ 8,191.8 Nm = TRUE ≠ clutch fill phase ≥ 690.0 kPa ≥ 690.0 kPa ≥ 750.0 kPa	P0747 C1 clutch exhaust delay time open throttle power on up shift OR P0747 C1 clutch exhaust delay time garage shift OR P0747 C1 clutch exhaust delay time closed throttle down shift OR P0747 C1 clutch exhaust delay time negative torque up shift OR P0747 C1 clutch exhaust delay time open throttle power down shift see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					coming clutch pressure OR negative torque up shift primary on coming clutch pressure OR open throttle power down shift primary on coming clutch pressure OR closed throttle down shift primary on coming clutch pressure C1 clutch slip speed valid, all speed sesnors are functional for lever node cluth slip speed calculation	≥ 690.0 kPa ≥ 690.0 kPa ≥ 690.0 kPa = TRUE		
					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			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed \geq clutch slip speed fail threshold.</p> <p>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:</p> <p>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.</p> <p>OR</p> <p>The automatic transmission shift completes, range shift state = range shift complete.</p> <p>NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control</p>			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>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 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 DTCs to set P0747, P0777, P0797, P2715, P2724, P2733, P2821.</p> <p>DTCs not fault pending</p>	<p>P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0</p>		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not test fail this key on DTCs not fault active	P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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	C1 clutch slip speed, update fail time 6.25 millisecond update	≥ 200.0 RPM	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	= 1 Boolean = 1 Boolean ≥ 9.00 volts = 0 Boolean = 0 Boolean ≥ 9.00 volts = TRUE Boolean = TRUE Boolean = FALSE Boolean = FALSE Boolean	fail time ≥ 3.00 seconds, update fail count, fail count ≥ 3 counts 6.25 millisecond update battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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			available: engine speed enable C2 clutch slip speed fail compare when: diagnostic clutch test C2 ((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 FASLE (startle mitigation) clutch steady state adaptive active transmission output shaft speed C2 clutch slip speed valid, all speed sesnors are functional for lever node clutch slip speed calculation accelerator pedal position engine speed diagnostic clutch test C2 set to HOLDING CLUTCH when: clutch solenoid test state	≥ 400.0 RPM = HOLDING CLUTCH = FALSE = TRUE ≠ initial startle mitigation gear = FALSE = 0 Boolean = FALSE ≥ 100.0 RPM = TRUE ≥ 2.00 % ≥ 1,500.0 RPM = NEUTRAL TEST	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>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 C2 CB29 or GR10 C2 CB128910R, clutch pressure control solenoid.</p>			<p>((startle mitigation active OR (startle mitigation active AND (startle mitigation gear)) (see startle mitigation active NOTE below) C2 clutch pressured map</p> <p>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</p> <p>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</p> <p>NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on</p>	<p>= FALSE = TRUE ≠ initial startle mitigation gear = mapped to line pressure, C2 clutch pressure has transtioned from off-applying-applied = TRUE ≠ range shift completed = 1 Boolean = forward gear OR = 0 Boolean = reverse gear = FALSE ≠ NEUTRAL TEST = range shift completed</p>	<p>initialize range shift complete time = 0.500 seconds, range shift complete time must time down to zero when range shift complete</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715 P2724 P2733 P2821 DTCs not fault pending DTCs not test fail this key on DTCs not fault active	P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0 P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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 a clutch pressure control solenoid stuck			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: engine speed transmission output shaft speed set solenoid stuck on test trigger to TRUE when: clutch pressure control solenoid stuck off stuck intrusive shift request startle mitigation active (see startle mitigation active NOTE below) clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) initialize active clutch controller (clutch control processing in process of sequencing clutches on	= TRUE Boolean = FALSE Boolean = FALSE Boolean ≥ 400.0 RPM ≥ 89.0 RPM = FALSE = FALSE ≠ TIE UP TEST TEST STATE ≠ TIE UP TEST HOLD = TRUE	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		on test is disabled. This diagnostic monitor is relative to the GF9 C2 CB29 or GR10 C2 CB128910R, clutch pressure control solenoid.			and off for auto trans shift) (shift type enable for staged steady state shift - shift in process when new shift type occurs - interrupted shift OR shift type enable for garage shift OR shift type enable for negative torque up shift OR shift type enable for open throttle power on up shift OR shift type enable for closed throttle down shift OR shift type enable for open throttle power down shift OR shift type enable for closed throttle lift foot up shift) OR clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) transition clutch controller active clutch controller (staged steady sate shift - shift not in process, no new shift type occuring, no interrupted shift) set clutch control solenoid test state to TIE UP TEST	= 0 Boolean = 0 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = TIE UP TEST TEST STATE = TIE UP TEST HOLD = TRUE ≠ staged steady state		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					TEST STATE when: solenoid stuck on test trigger current loop clutch control solenoid test state OR current loop clutch control solenoid test state (see clutch control solenoid test state NOTE below) range shift state solenoid stuck on test trigger additional off going clutch occurred (clutch control solenoid test state OR clutch control solenoid test state) (see clutch control solenoid test state NOTE below) diagnostic clutch test (C2 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable) OR C2 off going clutch pressure	= TRUE = TEST WAITING = TIE UP TEST HOLD ≠ range shift complete = TRUE = TRUE = TIE UP TEST TEST STATE = TIE UP TEST HOLD = OFF GOING CLUTCH TEST = TRUE = 1 Boolean ≤ 350.0 kPa	for C2 off going clutch pressure time ≥ P0777 C2 clutch exhaust delay time closed throttle lift foot up shift OR	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					engine torque primary on coming clutch active primary on coming control state closed throttle lift foot up shift primary on coming clutch pressure OR open throttle power on up shift primary on coming clutch pressure OR garage shift primary on	$\geq 8,191.8 \text{ Nm}$ = TRUE \neq clutch fill phase $\geq 800.0 \text{ kPa}$ $\geq 800.0 \text{ kPa}$ $\geq 750.0 \text{ kPa}$	P0777 C2 clutch exhaust delay time open throttle power on up shift OR P0777 C2 clutch exhaust delay time garage shift OR P0777 C2 clutch exhaust delay time closed throttle down shift OR P0777 C2 clutch exhaust delay time negative torque up shift OR P0777 C2 clutch exhaust delay time open throttle power down shift see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					coming clutch pressure OR negative torque up shift primary on coming clutch pressure OR open throttle power down shift primary on coming clutch pressure OR closed throttle down shift primary on coming clutch pressure C2 clutch slip speed valid, all speed sesnors are functional for lever node cluth slip speed calculation	≥ 800.0 kPa ≥ 800.0 kPa ≥ 800.0 kPa = TRUE		
					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			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed \geq clutch slip speed fail threshold.</p> <p>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:</p> <p>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.</p> <p>OR</p> <p>The automatic transmission shift completes, range shift state = range shift complete.</p> <p>NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control</p>			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>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 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 DTCs to set P0747, P0777, P0797, P2715, P2724, P2733, P2821.</p> <p>DTCs not fault pending</p>	<p>P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0</p>		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not test fail this key on DTCs not fault active	P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 sensor raw voltage, update fail time, 12.5 millisecond update rate	≤ 0.2500 volts (≤ 0.5 Ω 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 12.5 millisecond update rate fail count ≥ 16 counts 12.5 millisecond update rate run crank and battery voltage time ≥ 5.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 sensor raw voltage, update fail time, 12.5 millisecond update rate	≥ 4.7500 volts (≤ 0.5 Ω 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 12.5 millisecond update rate fail count ≥ 16 counts 12.5 millisecond update rate run crank and battery voltage time ≥ 5.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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	C1 clutch slip speed, update fail time 6.25 millisecond update	≥ 200.0 RPM	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	= 1 Boolean = 1 Boolean ≥ 9.00 volts = 0 Boolean = 0 Boolean ≥ 9.00 volts = TRUE Boolean = TRUE Boolean = FALSE Boolean = FALSE Boolean	fail time ≥ 3.00 seconds, update fail count, fail count ≥ 3 counts 6.25 millisecond update battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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			available: engine speed enable C3 clutch slip speed fail compare when: diagnostic clutch test C3 ((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 FASLE (startle mitigation) clutch steady state adaptive active transmission output shaft speed C3 clutch slip speed valid, all speed sesnors are functional for lever node clutch slip speed calculation accelerator pedal position engine speed diagnostic clutch test C3 set to HOLDING CLUTCH when: clutch solenoid test state	≥ 400.0 RPM = HOLDING CLUTCH = FALSE = TRUE ≠ initial startle mitigation gear = FALSE = 0 Boolean = FALSE ≥ 100.0 RPM = TRUE ≥ 2.00 % ≥ 1,500.0 RPM = NEUTRAL TEST	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>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 C3 CB38, or, GR10 C3 CB123456R, clutch pressure control solenoid.</p>			<p>((startle mitigation active OR (startle mitigation active AND (startle mitigation gear)) (see startle mitigation active NOTE below) C3 clutch pressured map</p> <p>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</p> <p>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</p> <p>NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on</p>	<p>= FALSE = TRUE ≠ initial startle mitigation gear = mapped to line pressure, C3 clutch pressure has transtioned from off-applying-applied = TRUE ≠ range shift completed = 1 Boolean = forward gear OR = 0 Boolean = reverse gear = FALSE ≠ NEUTRAL TEST = range shift completed</p>	<p>initialize range shift complete time = 0.500 seconds, range shift complete time must time down to zero when range shift complete</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715 P2724 P2733 P2821 DTCs not fault pending DTCs not test fail this key on DTCs not fault active	P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0 P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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 a clutch pressure control solenoid stuck			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: engine speed transmission output shaft speed set solenoid stuck on test trigger to TRUE when: clutch pressure control solenoid stuck off stuck intrusive shift request startle mitigation active (see startle mitigation active NOTE below) clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) initialize active clutch controller (clutch control processing in process of sequencing clutches on	= TRUE Boolean = FALSE Boolean = FALSE Boolean ≥ 400.0 RPM ≥ 89.0 RPM = FALSE = FALSE ≠ TIE UP TEST TEST STATE ≠ TIE UP TEST HOLD = TRUE	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		on test is disabled. This diagnostic monitor is relative to the GF9 C3 CB38, or, GR10 C3 CB123456R, clutch pressure control solenoid.			and off for auto trans shift) (shift type enable for staged steady state shift - shift in process when new shift type occurs - interrupted shift OR shift type enable for garage shift OR shift type enable for negative torque up shift OR shift type enable for open throttle power on up shift OR shift type enable for closed throttle down shift OR shift type enable for open throttle power down shift OR shift type enable for closed throttle lift foot up shift) OR clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) transition clutch controller active clutch controller (staged steady sate shift - shift not in process, no new shift type occuring, no interrupted shift) set clutch control solenoid test state to TIE UP TEST	= 0 Boolean = 0 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = TIE UP TEST TEST STATE = TIE UP TEST HOLD = TRUE ≠ staged steady state		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					TEST STATE when: solenoid stuck on test trigger current loop clutch control solenoid test state OR current loop clutch control solenoid test state (see clutch control solenoid test state NOTE below) range shift state solenoid stuck on test trigger additional off going clutch occurred (clutch control solenoid test state OR clutch control solenoid test state) (see clutch control solenoid test state NOTE below) diagnostic clutch test (C3 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable) OR C3 off going clutch pressure	= TRUE = TEST WAITING = TIE UP TEST HOLD ≠ range shift complete = TRUE = TRUE = TIE UP TEST TEST STATE = TIE UP TEST HOLD = OFF GOING CLUTCH TEST = TRUE = 1 Boolean ≤ 350.0 kPa	for C3 off going clutch pressure time ≥ P0797 C3 clutch exhaust delay time closed throttle lift foot up shift OR	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					engine torque primary on coming clutch active primary on coming control state closed throttle lift foot up shift primary on coming clutch pressure OR open throttle power on up shift primary on coming clutch pressure OR garage shift primary on	≥ 8,191.8 Nm = TRUE ≠ clutch fill phase ≥ 500.0 kPa ≥ 500.0 kPa ≥ 750.0 kPa	P0797 C3 clutch exhaust delay time open throttle power on up shift OR P0797 C3clutch exhaust delay time garage shift OR P0797 C3 clutch exhaust delay time closed throttle down shift OR P0797 C3 clutch exhaust delay time negative torque up shift OR P0797 C3 clutch exhaust delay time open throttle power down shift see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					coming clutch pressure OR negative torque up shift primary on coming clutch pressure OR open throttle power down shift primary on coming clutch pressure OR closed throttle down shift primary on coming clutch pressure C3 clutch slip speed valid, all speed sesnors are functional for lever node cluth slip speed calculation	≥ 500.0 kPa ≥ 500.0 kPa ≥ 500.0 kPa = TRUE		
					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			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed \geq clutch slip speed fail threshold.</p> <p>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:</p> <p>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.</p> <p>OR</p> <p>The automatic transmission shift completes, range shift state = range shift complete.</p> <p>NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control</p>			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>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 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 DTCs to set P0747, P0777, P0797, P2715, P2724, P2733, P2821.</p> <p>DTCs not fault pending</p>	<p>P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0</p>		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not test fail this key on DTCs not fault active	P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Input/Turbine Speed Sensor A 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 input/turbine speed sensor raw voltage, update fail time, 12.5 millisecond update rate	≤ 0.2500 volts (≤ 0.5 Ω 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 12.5 millisecond update rate fail count ≥ 16 counts 12.5 millisecond update rate run crank and battery voltage time ≥ 5.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Input/Turbine Speed Sensor A 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 sensor raw voltage, update fail time, 12.5 millisecond update rate	≥ 4.7500 volts (≤ 0.5 Ω 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 12.5 millisecond update rate fail count ≥ 16 counts 12.5 millisecond update rate run crank and battery voltage time ≥ 5.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Upshift Switch Circuit	P0815	Diagnoses the state of the upshift switch circuit, stuck in the state "tap up" (upshift) active.	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 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 D2 OR D3 OR D4 OR D5 OR D6 OR D7 OR D8 OR D9 OR D10 OR NEUTRAL OR PARK OR REVERSE DTCs not fault pending	= FALSE = 1 Boolean ≥ 5.00 volts ≥ 9.00 volts = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1 Boolean = 0 Boolean = 0 Boolean = 0 Boolean = 0 Boolean Transmission Shift Lever Position Validity	fail time 2 ≥ 120.00 seconds run crank voltage time ≥ 25 milliseconds ≥ 1.00 seconds	Special Type C
			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 P1761 fault active P0826 fault active P0826 test fail this key on	= FALSE = 1 Boolean ≥ 5.00 volts ≥ 9.00 volts = FALSE = FALSE = FALSE	fail time 1 ≥ 1.00 seconds run crank voltage time ≥ 25 milliseconds	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P0826 fault pending (P0815 fault active OR P0815 fault active test fail this key on) PRNDL range change time PRNDL in range: D1 OR D2 OR D3 OR D4 OR D5 OR D6 OR D7 OR D8 OR D9 OR D10 OR NEUTRAL OR PARK OR REVERSE DTCs not fault pending	= FALSE = FALSE = FALSE = 1 Boolean = 0 Boolean = 0 Boolean = 0 Boolean = 0 Boolean Transmission Shift Lever Position Validity	≥ 1.00 seconds	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Downshift Switch Circuit	P0816	Diagnoses the state of the downshift switch circuit, stuck in the state "tap down" (downshift) active.	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 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 D2 OR D3 OR D4 OR D5 OR D6 OR D7 OR D8 OR D9 OR D10 OR NEUTRAL OR PARK OR REVERSE DTCs not fault pending	= FALSE = 1 Boolean ≥ 5.00 volts ≥ 9.00 volts = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1 Boolean = 0 Boolean = 0 Boolean = 0 Boolean = 0 Boolean Transmission Shift Lever Position Validity	fail time 2 ≥ 120.00 seconds run crank voltage time ≥ 25 milliseconds ≥ 1.00 seconds	Special Type C
			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 P1761 fault active P0826 fault active P0826 test fail this key on	= FALSE = 1 Boolean ≥ 5.00 volts ≥ 9.00 volts = FALSE = FALSE = FALSE	fail time 1 ≥ 1.00 seconds run crank voltage time ≥ 25 milliseconds	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Up and Down Shift Switch Circuit	P0826	Diagnoses the state of the upshift/downshift switch circuit at an illegal voltage, voltage out of range.	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	Special Type C

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid A Control Circuit Open	P0960	Controller specific circuit diagnoses 9 speed CB123456 or 10 speed CB123456R 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 Increment fail time	$\geq 200\text{ K } \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid A Control Circuit Low Voltage	P0962	Controller specific circuit diagnoses 9 speed CB123456 or 10 speed CB123456R 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid A Control Circuit High Voltage	P0963	Controller specific circuit diagnoses 9 speed CB123456 or 10 speed CB123456R 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid B Control Circuit Open	P0964	Controller specific circuit diagnoses 9 speed CB29 or 10 speed CB128910R 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 Increment fail time	$\geq 200\text{ K } \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid B Control Circuit Low Voltage	P0966	Controller specific circuit diagnoses 9 speed CB123456 or 10 speed CB123456R 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid B Control Circuit High Voltage	P0967	Controller specific circuit diagnoses 9 speed CB123456 or 10 speed CB123456R 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid C Control Circuit Open	P0968	Controller specific circuit diagnoses 9 speed CB38 or 10 speed C23457910 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 Increment fail time	$\geq 200\text{ K } \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid C Control Circuit Low Voltage	P0970	Controller specific circuit diagnoses 9 speed CB38 or 10 speed C23457910 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid C Control Circuit High Voltage	P0971	Controller specific circuit diagnoses 9 speed CB38 or 10 speed C23457910 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Serial Peripheral Interface Bus 2	P16E9	This DTC detects intermittent 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 secondary processor before and after receiving a valid message.			Run/Crank voltage > 6.41	Number of invalid messages > 64.00 OR Amount of time before first message received since initialization > 0.19 counts continuous; 12.5 ms /count in the TCM secondary processor	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Serial Peripheral Interface Bus 1	P16F0	This DTC detects intermittent 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 before receiving a valid message.			Run/Crank voltage > 6.41	39 / 399 counts continuous; 12.5 ms /count in the TCM main processor	Type A, 1 Trips
			This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor after receiving a valid message.			Run/Crank voltage > 6.41	159 / 399 counts continuous; 12.5 ms /count in the TCM main processor	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.	
Internal Control Module Redundant Memory Performance	P16F3	Transmission Control Module	Safety Monitor Enable Criteria	= FALSE Boolean	Reduandant Memory Command Pressure Enable Calibraton Not	= 1 Boolean	Single Event	Type A, 1 Trips	
			Safety Monitor Enable Criteria	= TRUE Boolean	Reduandant Memory Command Pressure Enable Calibraton	= 0 Boolean	Single Event		
			AND						
			No traction event in progress	diffeerence between driven and non-driven wheel speeds: >= 50.00 pct			Single Event		
			AND						
			Change in vehicle velocity output speed greater than threshold measure by slip speed across all nodes.	Threshold function: TOSS measured with 25ms running delta sampled 6.25ms > (<brake gain> 0.75 * <pct>brake pedal) index : P2D2 Clutch Slip Sum			Single Event		
AND									
			Condition timer greater than threshold	= TRUE Boolean			>= 0.00 seconds		
			AND						
			Command clutch pressure	Thresholds for clutches					

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			<p>on released clutch greater than threshold</p> <p style="text-align: center;">AND</p> <p>*Monitor is disabled if Fault Active or codes for: Speeds Sensors 1/2/3, High Side Drivers 1/2 or service fast learn active.</p> <p>Brake Pedal is defaulted is FA</p> <p>Engine torque is defaulted is FA</p>	<p>by gear:</p> <p><=</p> <p>P2D2 Decel Pressure - C1</p> <p><=</p> <p>P2D2 Decel Pressure - C2</p> <p><=</p> <p>P2D2 Decel Pressure - C3</p> <p><=</p> <p>P2D2 Decel Pressure - C4</p> <p><=</p> <p>P2D2 Decel Pressure - C5</p> <p><=</p> <p>P2D2 Decel Pressure - C6</p> <p><=</p> <p>P2D2 Decel Pressure - C7</p> <p>*See Attached Supporting Tables:</p>				

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			<p>Safety Monitor Enable Criteria</p> <p>Safety Monitor Enable Criteria</p> <p>Command gear too low for present vehicle velocity and pedal position</p>	<p>= FALSE Boolean</p> <p>= TRUE Boolean</p> <p>Commanded Gear Threshold by vehicle velocity:</p> <p><= 1st FWD Thrshld <= 1st REV Thrshld <=2nd FWD Thrshld <=2nd REV Thrshld <=3rd FWD Thrshld <=4th FWD Thrshld <=5th FWD Thrshld <=6th FWD Thrshld <=7th FWD Thrshld <=8th FWD Thrshld <=9th FWD Thrshld <= REV Thrshld (Negative Velocity)</p> <p><= REV Thrshld (Forward Velocity)</p> <p>*See Attached Supporting Tables:</p>	<p>Reduandant Memory Command Gear Enable Calibraiton Not</p> <p>Reduandant Memory Command Gear Enable Calibraiton</p>	<p>= 1 Boolean</p> <p>= 0 Boolean</p>	<p>Single Event</p>	
			<p>*Monitor is disabled if: TISS FA or TOSS</p>					

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			directional FA, SFL or HSD 1/2 are OFF					

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		signal is diagnosed independently electrically and for performance of this DTC. The transmission output speed sensor data parameters that are calculated at different rates must always be within a negligible difference of each other.						

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Up and Down Shift Switch Signal Circuit	P1761	The alive rolling count normally cycles 0, 1, 2, and 3 as a serial data periodic frame is processed normally. The diagnostic monitor counts the number of times an alive rolling count error occurs over a period of time. The TCM receives a serial data frame at a periodic rate, during which, the receive data is processed the comparing the current value of the alive rolling count in the frame data to the incremented value of the diagnostic alive rolling count. When the two values of the alive rolling count do not agree, an alive rolling count error has occurred. The error indicator is saved in an array buffer, and when the number of error indicators in the buffer exceed the fail threshold the fail time is allowed to time up.	alive rolling count error counter update fail time 100 millisecond update rate	≥ 3 counts	service mode \$04 active diagnostic monitor enable run crank voltage up and down shift serial data frame receive occurred when up and down shift serial data frame receive occurred: increment the diagnsotic alive rolling count data value, if the diagnsotic alive rolling count data value, set alive rolling count error to TRUE, when alive rolling count error AND previous alive rolling count error in 10 element array buffer, increment alive rolling count error counter	= FALSE = 1 Boolean ≥ 9.00 volts = TRUE ≠ frame alive rolling count data value = TRUE = FALSE	fail time ≥ 10.00 seconds run crank voltage time ≥ 0.100 seconds	Special Type C

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					service fast learn active run crank voltage transmission hydraulic pressure available: engine speed	= FALSE ≥ 9.00 volts ≥ 400.0 RPM	seconds run crank voltage time ≥ 0.100 seconds engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 sensor raw voltage, update fail time, 12.5 millisecond update rate	≤ 0.2500 volts (≤ 0.5 Ω 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 Boolean = FALSE = FALSE ≥ 10.00 volts ≥ 10.00 volts = FALSE = FALSE	fail time ≥ 0.050 seconds, update fail count 12.5 millisecond update rate fail count ≥ 40 counts 12.5 millisecond update rate run crank and battery voltage time ≥ 5.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 sensor raw voltage, update fail time, 12.5 millisecond update rate	≥ 4.7500 volts ($\leq 0.5 \Omega$ 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 Boolean = FALSE = FALSE ≥ 10.00 volts ≥ 10.00 volts = FALSE = FALSE	fail time ≥ 0.050 seconds, update fail count 12.5 millisecond update rate fail count ≥ 40 counts 12.5 millisecond update rate run crank and battery voltage time ≥ 5.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 senor raw direction when transitional period = FALSE AND intermediate speed senor raw direction when transitional period = FALSE OR intermediate speed senor raw when transitional period = TRUE update fail and sample time 6.26 millisecond update rate	≠ FORWARD ≠ REVERSE ≥ 25.0 RPM	service mode \$04 active diagnostic monitor enable intermediate speed senor count sample period P17D3 fault active OR P17D3 test fail this key on senor type caillbration (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_Singl eSpdSnsr ≥ 0.3994 seconds ≤ 0.3193 seconds < 0.2080 seconds > 0.1523 seconds < 0.0518 seconds > 0.0381 seconds < 0.3994 seconds > 0.3193 seconds	fail time ≥ 3.500 seconds out of sample time ≥ 5.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Actuator Supply Voltage B Circuit Low	P2670	Controller specific output driver circuit diagnoses the high sided driver circuit 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.	$\leq \leq 0.5 \Omega$ impedance between signal and controller ground	diagnostic monitor enable high side drive 2 ON P2670 fault active P2670 test fail this key on	= 1 Boolean = TRUE = FALSE = FALSE	fail count ≥ 6 counts out of sample count $\geq 2,395$ counts 6.25 millisecond update rate	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid D Stuck Off	P2714	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 millisecond update	≥ 200.0 RPM	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	= 1 Boolean = 1 Boolean ≥ 9.00 volts = 0 Boolean = 0 Boolean ≥ 9.00 volts = TRUE Boolean = TRUE Boolean = FALSE Boolean = FALSE Boolean	fail time ≥ 3.00 seconds, update fail count, fail count ≥ 3 counts 6.25 millisecond update battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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			available: engine speed enable C4 clutch slip speed fail compare when: diagnostic clutch test C4 ((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 FASLE (startle mitigation) clutch steady state adaptive active transmission output shaft speed C4 clutch slip speed valid, all speed sesnors are functional for lever node clutch slip speed calculation accelerator pedal position engine speed diagnostic clutch test C4 set to HOLDING CLUTCH when: clutch solenoid test state	≥ 400.0 RPM = HOLDING CLUTCH = FALSE = TRUE ≠ initial startle mitigation gear = FALSE = 0 Boolean = FALSE ≥ 100.0 RPM = TRUE ≥ 2.00 % ≥ 1,500.0 RPM = NEUTRAL TEST	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>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 C4 C4, or, GR10 C4 C123467810R, clutch pressure control solenoid.</p>			<p>((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) C4 clutch pressured map</p> <p>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</p> <p>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</p> <p>NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on</p>	<p>= FALSE = TRUE ≠ initial startle mitigation gear = mapped to line pressure, C4 clutch pressure has transtioned from off-applying-applied</p> <p>= TRUE ≠ range shift completed</p> <p>= 1 Boolean = forward gear OR = 0 Boolean = reverse gear = FALSE ≠ NEUTRAL TEST = range shift completed</p>	<p>initialize range shift complete time = 0.500 seconds, range shift complete time must time down to zero when range shift complete</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715 P2724 P2733 P2821 DTCs not fault pending DTCs not test fail this key on DTCs not fault active	P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0 P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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 a clutch pressure control solenoid stuck			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: engine speed transmission output shaft speed set solenoid stuck on test trigger to TRUE when: clutch pressure control solenoid stuck off stuck intrusive shift request startle mitigation active (see startle mitigation active NOTE below) clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) initialize active clutch controller (clutch control processing in process of sequencing clutches on	= TRUE Boolean = FALSE Boolean = FALSE Boolean ≥ 400.0 RPM ≥ 89.0 RPM = FALSE = FALSE ≠ TIE UP TEST TEST STATE ≠ TIE UP TEST HOLD = TRUE	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		on test is disabled. This diagnostic monitor is relative to the GF9 C4 C4, or, GR10 C4 C123467810R, clutch pressure control solenoid.			and off for auto trans shift) (shift type enable for staged steady state shift - shift in process when new shift type occurs - interrupted shift OR shift type enable for garage shift OR shift type enable for negative torque up shift OR shift type enable for open throttle power on up shift OR shift type enable for closed throttle down shift OR shift type enable for open throttle power down shift OR shift type enable for closed throttle lift foot up shift) OR clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) transition clutch controller active clutch controller (staged steady sate shift - shift not in process, no new shift type occuring, no interrupted shift) set clutch control solenoid test state to TIE UP TEST	= 0 Boolean = 0 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = TIE UP TEST TEST STATE = TIE UP TEST HOLD = TRUE ≠ staged steady state		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.	
					TEST STATE when: solenoid stuck on test trigger current loop clutch control solenoid test state OR current loop clutch control solenoid test state (see clutch control solenoid test state NOTE below) range shift state solenoid stuck on test trigger additional off going clutch occurred (clutch control solenoid test state OR clutch control solenoid test state) (see clutch control solenoid test state NOTE below) diagnostic clutch test (C4 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable) OR C4 off going clutch pressure	= TRUE = TEST WAITING = TIE UP TEST HOLD ≠ range shift complete = TRUE = TRUE = TIE UP TEST TEST STATE = TIE UP TEST HOLD = OFF GOING CLUTCH TEST = TRUE = 1 Boolean ≤ 350.0 kPa		for C4 off going clutch pressure time ≥ P2715 C4 clutch exhaust delay time closed throttle lift foot up shift OR	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					engine torque primary on coming clutch active primary on coming control state closed throttle lift foot up shift primary on coming clutch pressure OR open throttle power on up shift primary on coming clutch pressure OR garage shift primary on	$\geq 8,191.8 \text{ Nm}$ = TRUE \neq clutch fill phase $\geq 850.0 \text{ kPa}$ $\geq 850.0 \text{ kPa}$ $\geq 750.0 \text{ kPa}$	P2715 C4 clutch exhaust delay time open throttle power on up shift OR P2715 C4 clutch exhaust delay time garage shift OR P2715 C4 clutch exhaust delay time closed throttle down shift OR P2715 C4 clutch exhaust delay time negative torque up shift OR P2715 C4 clutch exhaust delay time open throttle power down shift see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					coming clutch pressure OR negative torque up shift primary on coming clutch pressure OR open throttle power down shift primary on coming clutch pressure OR closed throttle down shift primary on coming clutch pressure C4 clutch slip speed valid, all speed sensors are functional for lever node clutch slip speed calculation	≥ 850.0 kPa ≥ 850.0 kPa ≥ 850.0 kPa = TRUE		
					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			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed \geq clutch slip speed fail threshold.</p> <p>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:</p> <p>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.</p> <p>OR</p> <p>The automatic transmission shift completes, range shift state = range shift complete.</p> <p>NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control</p>			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>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 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 DTCs to set P0747, P0777, P0797, P2715, P2724, P2733, P2821.</p>	<p>P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0</p>		
					<p>DTCs not fault pending</p>			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not test fail this key on DTCs not fault active	P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid D Control Circuit Open	P2718	Controller specific circuit diagnoses 9 speed C4 or 10 speed C123467810R 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 Increment fail time	$\geq 200\text{ K } \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid D Control Circuit Low	P2720	Controller specific circuit diagnoses 9 speed C4 or 10 speed C123467810R 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid D Control Circuit High	P2721	Controller specific circuit diagnoses 9 speed C4 or 10 speed C123467810R 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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	C1 clutch slip speed, update fail time 6.25 millisecond update	≥ 200.0 RPM	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	= 1 Boolean = 1 Boolean ≥ 9.00 volts = 0 Boolean = 0 Boolean ≥ 9.00 volts = TRUE Boolean = TRUE Boolean = FALSE Boolean = FALSE Boolean	fail time ≥ 3.00 seconds, update fail count, fail count ≥ 3 counts 6.25 millisecond update battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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			available: engine speed enable C5 clutch slip speed fail compare when: diagnostic clutch test C5 ((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 FASLE (startle mitigation) clutch steady state adaptive active transmission output shaft speed C5 clutch slip speed valid, all speed sesnors are functional for lever node clutch slip speed calculation accelerator pedal position engine speed diagnostic clutch test C5 set to HOLDING CLUTCH when: clutch solenoid test state	≥ 400.0 RPM = HOLDING CLUTCH = FALSE = TRUE ≠ initial startle mitigation gear = FALSE = 0 Boolean = FALSE ≥ 100.0 RPM = TRUE ≥ 2.00 % ≥ 1,500.0 RPM = NEUTRAL TEST	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>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 C5 C57R, or, GR10 C5 C1356789, clutch pressure control solenoid.</p>			<p>((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) C5 clutch pressured map</p> <p>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</p> <p>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</p> <p>NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on</p>	<p>= FALSE = TRUE ≠ initial startle mitigation gear = mapped to line pressure, C5 clutch pressure has transtioned from off-applying-applied</p> <p>= TRUE ≠ range shift completed</p> <p>= 1 Boolean = forward gear OR = 0 Boolean = reverse gear = FALSE ≠ NEUTRAL TEST = range shift completed</p>	<p>initialize range shift complete time = 0.500 seconds, range shift complete time must time down to zero when range shift complete</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715 P2724 P2733 P2821 DTCs not fault pending DTCs not test fail this key on DTCs not fault active	P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0 P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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 a clutch pressure control solenoid stuck			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: engine speed transmission output shaft speed set solenoid stuck on test trigger to TRUE when: clutch pressure control solenoid stuck off stuck intrusive shift request startle mitigation active (see startle mitigation active NOTE below) clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) initialize active clutch controller (clutch control processing in process of sequencing clutches on	= TRUE Boolean = FALSE Boolean = FALSE Boolean ≥ 400.0 RPM ≥ 89.0 RPM = FALSE = FALSE ≠ TIE UP TEST TEST STATE ≠ TIE UP TEST HOLD = TRUE	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		on test is disabled. This diagnostic monitor is relative to the GF9 C5 C57R, or, GR10 C5 C1356789, clutch pressure control solenoid.			and off for auto trans shift) (shift type enable for staged steady state shift - shift in process when new shift type occurs - interrupted shift OR shift type enable for garage shift OR shift type enable for negative torque up shift OR shift type enable for open throttle power on up shift OR shift type enable for closed throttle down shift OR shift type enable for open throttle power down shift OR shift type enable for closed throttle lift foot up shift) OR clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) transition clutch controller active clutch controller (staged steady sate shift - shift not in process, no new shift type occuring, no interrupted shift) set clutch control solenoid test state to TIE UP TEST	= 0 Boolean = 0 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = TIE UP TEST TEST STATE = TIE UP TEST HOLD = TRUE ≠ staged steady state		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.	
					TEST STATE when: solenoid stuck on test trigger current loop clutch control solenoid test state OR current loop clutch control solenoid test state (see clutch control solenoid test state NOTE below) range shift state solenoid stuck on test trigger additional off going clutch occurred (clutch control solenoid test state OR clutch control solenoid test state) (see clutch control solenoid test state NOTE below) diagnostic clutch test (C5 off going clutch pressure control ramp time out complete AND off going clutch pressure ramp control ramp time out enable) OR C5 off going clutch pressure		= TRUE = TEST WAITING = TIE UP TEST HOLD ≠ range shift complete = TRUE = TRUE = TIE UP TEST TEST STATE = TIE UP TEST HOLD = OFF GOING CLUTCH TEST = TRUE = 1 Boolean ≤ 350.0 kPa	for C5 off going clutch pressure time ≥ P2724 C5 clutch exhaust delay time closed throttle lift foot up shift OR	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					engine torque primary on coming clutch active primary on coming control state closed throttle lift foot up shift primary on coming clutch pressure OR open throttle power on up shift primary on coming clutch pressure OR garage shift primary on	≥ 8,191.8 Nm = TRUE ≠ clutch fill phase ≥ 703.0 kPa OR ≥ 703.0 kPa OR ≥ 750.0 kPa	P2724 C5 clutch exhaust delay time open throttle power on up shift OR P2724 C5 clutch exhaust delay time garage shift OR P2724 C5 clutch exhaust delay time closed throttle down shift OR P2724 C5 clutch exhaust delay time negative torque up shift OR P2724 C5 clutch exhaust delay time open throttle power down shift see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					coming clutch pressure OR negative torque up shift primary on coming clutch pressure OR open throttle power down shift primary on coming clutch pressure OR closed throttle down shift primary on coming clutch pressure C5 clutch slip speed valid, all speed sensors are functional for lever node clutch slip speed calculation	≥ 703.0 kPa ≥ 703.0 kPa ≥ 703.0 kPa = TRUE		
					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			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed \geq clutch slip speed fail threshold.</p> <p>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:</p> <p>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.</p> <p>OR</p> <p>The automatic transmission shift completes, range shift state = range shift complete.</p> <p>NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control</p>			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>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 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 DTCs to set P0747, P0777, P0797, P2715, P2724, P2733, P2821.</p> <p>DTCs not fault pending</p>	<p>P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0</p>		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not test fail this key on DTCs not fault active	P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid E Control Circuit Open	P2727	Controller specific circuit diagnoses 9 speed C57R or 10 speed C1356789 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 Increment fail time	$\geq 200\text{ K } \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid E Control Circuit Low	P2729	Controller specific circuit diagnoses 9 speed C57R or 10 speed C1356789 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid E Control Circuit High	P2730	Controller specific circuit diagnoses 9 speed C57R or 10 speed C1356789 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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	C1 clutch slip speed, update fail time 6.25 millisecond update	≥ 200.0 RPM	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	= 1 Boolean = 1 Boolean ≥ 9.00 volts = 0 Boolean = 0 Boolean ≥ 9.00 volts = TRUE Boolean = TRUE Boolean = FALSE Boolean = FALSE Boolean	fail time ≥ 3.00 seconds, update fail count, fail count ≥ 3 counts 6.25 millisecond update battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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			available: engine speed enable C6 clutch slip speed fail compare when: diagnostic clutch test C6 ((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 FASLE (startle mitigation) clutch steady state adaptive active transmission output shaft speed C6 clutch slip speed valid, all speed sesnors are functional for lever node clutch slip speed calculation accelerator pedal position engine speed diagnostic clutch test C6 set to HOLDING CLUTCH when: clutch solenoid test state	≥ 400.0 RPM = HOLDING CLUTCH = FALSE = TRUE ≠ initial startle mitigation gear = FALSE = 0 Boolean = FALSE ≥ 100.0 RPM = TRUE ≥ 2.00 % ≥ 1,500.0 RPM = NEUTRAL TEST	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>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 C6 C6789/Selectable One Way Clutch (SOWC) CBR1, or, GR10 C6 C45678910R, clutch pressure control solenoid.</p>			<p>((startle mitigation active OR (startle mitigation active AND startle mitigation gear)) (see startle mitigation active NOTE below) C6 clutch pressured map</p> <p>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</p> <p>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</p> <p>NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on</p>	<p>= FALSE = TRUE ≠ initial startle mitigation gear = mapped to line pressure, C6 clutch pressure has transtioned from off-applying-applied</p> <p>= TRUE ≠ range shift completed</p> <p>= 1 Boolean = forward gear OR = 0 Boolean = reverse gear = FALSE ≠ NEUTRAL TEST = range shift completed</p>	<p>initialize range shift complete time = 0.500 seconds, range shift complete time must time down to zero when range shift complete</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715 P2724 P2733 P2821 DTCs not fault pending DTCs not test fail this key on DTCs not fault active	P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0 P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		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 a clutch pressure control solenoid stuck			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: engine speed transmission output shaft speed set solenoid stuck on test trigger to TRUE when: clutch pressure control solenoid stuck off stuck intrusive shift request startle mitigation active (see startle mitigation active NOTE below) clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) initialize active clutch controller (clutch control processing in process of sequencing clutches on	= TRUE Boolean = FALSE Boolean = FALSE Boolean ≥ 400.0 RPM ≥ 89.0 RPM = FALSE = FALSE ≠ TIE UP TEST TEST STATE ≠ TIE UP TEST HOLD = TRUE	engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		on test is disabled. This diagnostic monitor is relative to the GF9 C6 C6789/Selectable One Way Clutch (SOWC) CBR1, or, GR10 C6 C45678910R, clutch pressure control solenoid.			and off for auto trans shift) (shift type enable for staged steady state shift - shift in process when new shift type occurs - interrupted shift OR shift type enable for garage shift OR shift type enable for negative torque up shift OR shift type enable for open throttle power on up shift OR shift type enable for closed throttle down shift OR shift type enable for open throttle power down shift OR shift type enable for closed throttle lift foot up shift) OR clutch control solenoid test state clutch control solenoid test state (see clutch control solenoid test state NOTE below) transition clutch controller active clutch controller (staged steady sate shift - shift not in process, no new shift type occuring, no interrupted shift) set clutch control solenoid test state to TIE UP TEST	= 0 Boolean = 0 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 1 Boolean = 0 Boolean = TIE UP TEST TEST STATE = TIE UP TEST HOLD = TRUE ≠ staged steady state		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					TEST STATE when: solenoid stuck on test trigger current loop clutch control solenoid test state OR current loop clutch control solenoid test state (see clutch control solenoid test state NOTE below) range shift state solenoid stuck on test trigger additional off going clutch occurred (clutch control solenoid test state OR clutch control solenoid test state) (see clutch control solenoid test state NOTE below) diagnostic clutch test (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 pressure	= TRUE = TEST WAITING = TIE UP TEST HOLD ≠ range shift complete = TRUE = TRUE = TIE UP TEST TEST STATE = TIE UP TEST HOLD = OFF GOING CLUTCH TEST = TRUE = 1 Boolean ≤ 350.0 kPa	for C6 off going clutch pressure time ≥ P2733 C6 clutch exhaust delay time closed throttle lift foot up shift OR	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					engine torque primary on coming clutch active primary on coming control state closed throttle lift foot up shift primary on coming clutch pressure OR open throttle power on up shift primary on coming clutch pressure OR garage shift primary on	≥ 8,191.8 Nm = TRUE ≠ clutch fill phase ≥ 655.0 kPa OR ≥ 655.0 kPa OR ≥ 750.0 kPa	P2733 C6 clutch exhaust delay time open throttle power on up shift OR P2733 C6 clutch exhaust delay time garage shift OR P2733 C6 clutch exhaust delay time closed throttle down shift OR P2733 C6 clutch exhaust delay time negative torque up shift OR P2733 C6 clutch exhaust delay time open throttle power down shift see supporting tables	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					coming clutch pressure OR negative torque up shift primary on coming clutch pressure OR open throttle power down shift primary on coming clutch pressure OR closed throttle down shift primary on coming clutch pressure C6 clutch slip speed valid, all speed sensors are functional for lever node clutch slip speed calculation	≥ 655.0 kPa ≥ 655.0 kPa ≥ 655.0 kPa = TRUE		
					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			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>That off going clutch pressure control solenoid stuck on diagnostic monitor currently executing passes, the corresponding clutch slip speed \geq clutch slip speed fail threshold.</p> <p>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:</p> <p>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.</p> <p>OR</p> <p>The automatic transmission shift completes, range shift state = range shift complete.</p> <p>NOTE: Startle mitigation is used to detect unintended vehicle deceleration due to a clutch pressure control</p>			

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>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 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 DTCs to set P0747, P0777, P0797, P2715, P2724, P2733, P2821.</p> <p>DTCs not fault pending</p>	<p>P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0</p>		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not test fail this key on DTCs not fault active	P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid F Control Circuit Open	P2736	Controller specific circuit diagnoses 9 speed C6789 or 10 speed C45678910R 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 Increment fail time	$\geq 200\text{ K } \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid F Control Circuit Low	P2738	Controller specific circuit diagnoses 9 speed C6789 or 10 speed C45678910R 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid F Control Circuit High	P2739	Controller specific circuit diagnoses 9 speed C6789 or 10 speed C45678910R 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid A Calibration Incorrect	P27A7	The diagnostic monitor verifies that the pressure control solenoid A (GF9 line pressure or GR10 C1 C123456R clutch) 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.	<p>pressure control solenoid characterization data programming complete</p> <p>Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry.</p> <p>pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present:</p> <p>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</p>	= FALSE	<p>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.</p> <p>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.</p>		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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid B Calibration Incorrect	P27A8	The diagnostic monitor verifies that the pressure control solenoid B (GF9 TCC pressure or GR10 C2 C128910R clutch) 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.	<p>pressure control solenoid characterization data programming complete</p> <p>Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry.</p> <p>pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present:</p> <p>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</p>	= FALSE	<p>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.</p> <p>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.</p>		execution of monitor occurs once per controller normal power event during the controller initialization before normal time loop execution	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid C Calibration Incorrect	P27A9	The diagnostic monitor verifies that the pressure control solenoid C (GF9 C1 CB123456 clutch or GR10 C3 C23457910 clutch) characterization data is programmed correctly into the TCM EEPROM to match the pressure control solenoid C electrical characteristics of the device currently installed in the transmission valve body assembly.	<p>pressure control solenoid characterization data programming complete</p> <p>Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry.</p> <p>pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present:</p> <p>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</p>	= FALSE	<p>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.</p> <p>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.</p>		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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid D Calibration Incorrect	P27AA	The diagnostic monitor verifies that the pressure control solenoid D (GF9 C2 CB29 clutch or GR10 C5 C1356789 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.	<p>pressure control solenoid characterization data programming complete</p> <p>Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry.</p> <p>pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present:</p> <p>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</p>	= FALSE	<p>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.</p> <p>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.</p>		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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 C23467810R clutch) 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.	<p>pressure control solenoid characterization data programming complete</p> <p>Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry.</p> <p>pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present:</p> <p>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</p>	= FALSE	<p>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.</p> <p>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.</p>		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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 C45678910R clutch) 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.	<p>pressure control solenoid characterization data programming complete</p> <p>Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry.</p> <p>pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present:</p> <p>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</p>	= FALSE	<p>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.</p> <p>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.</p>		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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid G Calibration Incorrect	P27AD	The diagnostic monitor verifies that the pressure control solenoid G (GF9 C5 C57R clutch or GR10 line pressure) characterization data is programmed correctly into the TCM EEPROM to match the pressure control solenoid G electrical characteristics of the device currently installed in the transmission valve body assembly.	<p>pressure control solenoid characterization data programming complete</p> <p>Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry.</p> <p>pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present:</p> <p>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</p>	= FALSE	<p>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.</p> <p>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.</p>		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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid H Calibration Incorrect	P27AE	The diagnostic monitor verifies that the pressure control solenoid H (GF9 C6 C6789 clutch or GR10 TCC) 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.	<p>pressure control solenoid characterization data programming complete</p> <p>Matching is defined as pressure control solenoid characterization data corresponding to the transmission valve body assembly componentry.</p> <p>pressure control solenoid characterization data programming complete is set to FALSE when any of the following is present:</p> <p>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</p>	= FALSE	<p>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.</p> <p>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.</p>		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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

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

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Range Sensor A/B Correlation	P2805	Internal range sensor A is wired independently to the TCM while internal range sensor B is wired independently to the ECM. The monitor diagnoses the internal range sensor A PWM duty cycle by comparing the raw sensor A value against the raw sensor B adjusted value, to verify signals are consistent, or determine the TCM internal range sensor A does not correlate to the ECM internal range sensor B. The ECM transmits internal range sensor B raw PWM to the TCM over the serial data bus.	ABS((TCM internal range sensor A + ECM internal range sensor B raw adjusted for high or low time) - 100 %) Increment fail and sample time, update rate 25 milliseconds	> 4.999 % duty cycle	diagnostic monitor enable P0707 fault active P0708 fault active U0100 fault active ECM internal range sensor B available from ECM ECM internal range sensor B fault active battery voltage ABS(TCM internal range sensor A current loop value - TCM internal range sensor A previous loop value), update TCM internal range sensor A stability time, update rate 25 milliseconds ABS(ECM internal range sensor B current loop value - ECM internal range sensor B previous loop value), update ECM internal range sensor B stability time, update rate 25 milliseconds TCM internal range sensor A stability time met OR ECM internal range sensor B stability time met ECM internal range sensor B raw adjusted for	= 1 Boolean = FALSE = FALSE = FALSE = TRUE = FALSE ≥ 9.00 volts < 4.999 % duty cycle < 4.999 % duty cycle = ABS(ECM internal range sensor B raw -	PWM fail time ≥ 1.000 seconds out of sample time ≥ 1.000 seconds battery voltage time ≥ 1.000 seconds TCM internal range sensor A stability time ≥ 1.000 seconds ECM internal range sensor B stability time ≥ 1.000 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					high or low time	100.000 %)		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid G Control Circuit Open	P2812	Controller specific circuit diagnoses 9 speed Line Pressure Control Circuit or 10 speed Line Pressure Control Circuit for an open circuit failure by comparing a voltage measurement to controller specific voltage thresholds.	<p>Voltage measurement outside of controller specific acceptable range indicates an open circuit</p> <p>Controller specific circuit voltage thresholds are set to meet the following controller specification for an open circuit</p> <p>Increment fail time</p>	≥ 200 K Ω impedance between signal and controller ground	<p>battery voltage</p> <p>run crank voltage OR accessory voltage active</p> <p>diagnostic monitor enable calibration</p>	<p>≥ 8.00 volts and ≤ 32.00 volts</p> <p>≥ 5.00 volts</p> <p>= TRUE</p> <p>= 1 Boolean</p>	<p>≥ 1.000 seconds</p> <p>25 milliseconds</p> <p>12.5 milliseconds</p> <p>fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds</p>	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid G Control Circuit Low	P2814	Controller specific circuit diagnoses 9 speed Line Pressure Circuit or 10 speed Line Pressure 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid G Control Circuit High	P2815	Controller specific circuit diagnoses 9 speed Line Pressure Circuit or 10 speed Line Pressure 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					service fast learn active battery voltage run crank voltage P281B falut active P281D falut active P281E falut active P0722 fault pending P0723 fault pending P0716 fault pending P0717 fault pending P07BF fault pending P07C0 fault pending (PTO active OR PTO disable calibration) accelerator pedal position accelerator pedal position range shift state transmission fluid temperature transmission fluid temperature engine torque engine torque P2817 test fail this key on (TCC control mode OR TCC control mode) break latch state (clutch select valve solenoid) attained gear attained gear slip DTCs not fault active	= FALSE ≥ 9.00 volts ≥ 9.00 volts = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1 Boolean ≥ 8.0 % ≤ 100.0 % = range shift complete ≥ -6.66 °C ≤ 130.0 °C ≥ 50.0 Nm ≤ 8,191.8 Nm = FALSE = ON mode (controlled slip mode) = LOCK = disabled (clutch select valve not transitioning) ≥ ≤ 25.0 RPM	see supportinf table battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P0716, P0717, P07BF, P07C0 P0722, P0723, P077C, P077D		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control Solenoid H Stuck On	P2818	The diagnostic monitor detects the transmission torque converter control valve solenoid failed hydraulically on. The torque converter hydraulic control circuit is multiplexed with the transmission clutch select valve hydraulic control circuit, allowing for the torque converter control valve solenoid stuck on test to execute when the clutch select valve solenoid is commanded ON. When the clutch select valve solenoid is commanded ON as the vehicle speed decreases toward zero KPH, and, if the torque converter control valve solenoid is stuck on, the torque converter slip speed rate of change will have a large slope while decreasing toward zero RPM, and the torque converter slip speed will remain low near zero RPM.	while control valve test time timing down: rate of change of torque convert slip speed = (ABS (current loop value torque convert slip speed - previous loop value torque convert slip speed) / 25 milliseconds) when clutch select valve soleniod multiplexed to TCC hydraulic AND torque convert slip speed = ABS(engine speed - transmission input shaft speed) AND torque convert slip speed = engine speed - transmission input shaft speed torque convert slip speed torque convert slip speed THEN increment fail time 25 millisecond update rate	≥ P2818 torque convert derivative slip speed fail threshold see supporting table ≤ 300.0 RPM ≥ -50.0 RPM ≤ 30.0 RPM	diagnostic monitor enable (TCC stuck off enable OR TCC stuck on enable) hydraulic pressure available: engine speed service fast learn active battery voltage run crank voltage P281B falut active P281D falut active P281E falut active PRNDL PRNDL transmission fluid temperature transmission fluid	= 1 Boolean = 1 Boolean = 1 Boolean ≥ 400.0 RPM = FALSE ≥ 9.00 volts ≥ 9.00 volts = FALSE = FALSE = FALSE ≠ NEUTRAL ≠ REVERSE ≥ -6.66 °C ≤ 130.00 °C	fail time ≥ 1.500 seconds increment fail count fail count ≥ 2 counts 25 millisecond update rate engine speed time ≥ engine speed time for transmission hydraulic pressure available see supportinf table battery voltage time ≥ 0.100 seconds run crank voltage time ≥ 0.100 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					temperature accelerator pedal position accelerator pedal position vehicle speed vehicle speed TCC command mode break latch state (clutch select valve solenoid) P0722 fault pending P0723 fault pending P0716 fault pending P0717 fault pending P07BF fault pending P07C0 fault pending (PTO active OR PTO disable calibration) transmission fluid temperature transmission fluid temperature engine torque engine torque P2818 test fail this key on vehicle speed engine speed engine speed accelerator pedal position 4WD low state (driver shift mode active OR driver shift mode calibration) (misfire requests TCC off OR misfire TCC off calibration) (clutch control solenoid stuck on OR stuck OFF intrusive shift active) P0746 fault pending P0747 fault pending P0776 fault pending	≥ 0.00 % ≤ 20.00 % ≥ 0.0 KPH ≤ 45.0 KPH = OFF ≠ disabled (clutch select valve transitioning) = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE = 1 Boolean ≥ -6.66 °C ≤ 130.00 °C ≥ 55.0 Nm ≤ 800.0 Nm = FALSE ≤ 45.0 KPH ≥ 400.0 RPM ≤ 5,500.0 RPM ≤ 95.0 % = FALSE = FALSE = 0 Boolean = FALSE = 0 Boolean = FALSE = FALSE = FALSE		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTCs not fault active	AcceleratorPedalFailure EngineTorqueEstInaccu rate P0716, P0717, P07BF, P07C0 P0722, P0723, P077C, P077D		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control Solenoid H Control Circuit/Open	P281B	Controller specific circuit diagnoses 9 speed TCC Control Circuit or 10 speed TCC 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 Increment fail time	$\geq 200\text{ K } \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type B, 2 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control Solenoid H Control Circuit Low	P281D	Controller specific circuit diagnoses 9 speed TCC Pressure Control Circuit or 10 speed TCC Control 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control Solenoid H Control Circuit High	P281E	Controller specific circuit diagnoses 9 speed TCC Pressure Control Circuit or 10 speed TCC 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type B, 2 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control (PC) Solenoid J Stuck Off	P2820	<p>Each pressure control solenoid stuck off diagnostic monitor detects a clutch pressure 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.</p> <p>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 as hydraulic fluid is routed to the clutch C6 - C6789, or, 6th gear transmission gear ratio, based on transmission lever node design, the</p>	<p>gear ratio gear ratio OR C6 clutch slip speed, update fail time 6.25 millisecond update</p>	<p>≤ 1.700 ≥ 1.200 ≤ 20.0 RPM</p>	<p>use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage</p> <p>use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage</p> <p>TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled</p> <p>TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled</p> <p>service fast learn active service solenoid cleaning procedure active</p> <p>hydraulic pressure</p>	<p>= 1 Boolean = 1 Boolean ≥ 9.00 volts = 0 Boolean = 0 Boolean ≥ 9.00 volts = TRUE Boolean = TRUE Boolean = FALSE Boolean = FALSE Boolean</p>	<p>fail time ≥ 0.250 seconds, update fail count, fail count ≥ 2 counts 6.25 millisecond update</p> <p>battery voltage time ≥ 0.100 seconds</p> <p>run crank voltage time ≥ 0.100 seconds</p>	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>transmission input shaft speed, the transmission output shaft speed, and one transmission intermediate shaft speed, while not commanding 6th-9th gear, as the indication of the failure mode.</p> <p>This diagnostic monitor is relative to the GF9 clutch select valve pressure control solenoid.</p>			<p>available: engine speed</p> <p>diagnostic monitor enabled</p> <p>transmission output shaft speed</p> <p>transmission fluid temperature</p> <p>transmission fluid temperature</p> <p>P2820 test fail this key on (command gear OR attained gear)</p> <p>DTCs not fault pending</p> <p>DTCs not test fail this key on</p> <p>DTCs not fault active</p>	<p>≥ 400.0 RPM</p> <p>= 1 Boolean</p> <p>≥ 35.0 RPM</p> <p>≥ -7.00 °C</p> <p>≤ 130.0 °C</p> <p>= FALSE</p> <p>= 1st lock</p> <p>= 1st lock</p> <p>P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0</p> <p>P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821</p> <p>AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD</p>	<p>engine speed time ≥ engine speed time for transmission hydraulic pressure available see supporting table</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>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.</p> <p>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</p>			<p>use battery voltage calibration is FALSE OR (use battery voltage calibration is TRUE AND battery voltage</p> <p>use run crank voltage calibration is FALSE OR (use run crank voltage calibration is TRUE AND run crank voltage</p> <p>TCM output driver high side driver 1, clutch pressure control solenoid driver circuit enabled</p> <p>TCM output driver high side driver 2, clutch pressure control solenoid driver circuit enabled</p> <p>service fast learn active service solenoid cleaning procedure active</p> <p>hydraulic pressure available: engine speed</p>	<p>= 1 Boolean</p> <p>= 1 Boolean</p> <p>≥ 9.00 volts</p> <p>= 0 Boolean</p> <p>= 0 Boolean</p> <p>≥ 9.00 volts</p> <p>= TRUE Boolean</p> <p>= TRUE Boolean</p> <p>= FALSE Boolean = FALSE Boolean</p> <p>≥ 400.0 RPM</p>	<p>battery voltage time ≥ 0.100 seconds</p> <p>run crank voltage time ≥ 0.100 seconds</p> <p>engine speed time ≥</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>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.</p> <p>The clutch pressure control solenoid test is suspended if the higher level safety startle mitigation function is</p>			<p>diagnostic monitor enable transmission fluid temperature transmission fluid temperature P2821 test fail this key on</p> <p>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</p> <p>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</p> <p>Cx indicates any one of the 4 clutches: C3 (CB38) OR C4 (C4) OR C5 (C57R)</p> <p>enable Cx clutch slip</p>	<p>= 1 Boolean ≥ -7.00 °C</p> <p>≤ 130.0 °C</p> <p>= FALSE</p> <p>= 1 Boolean = forward gear</p> <p>= 0 Boolean = reverse gear = FALSE ≠ NEUTRAL TEST</p> <p>= range shift completed</p> <p>= TRUE</p> <p>≠ range shift completed</p>	<p>engine speed time for transmission hydraulic pressure available see supporting table</p> <p>initialize range shift complete time = 0.500 seconds, range shift complete time must time down to zero when range shift complete</p>	

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>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.</p> <p>This diagnostic monitor is relative to the GF9 clutch select valve pressure control solenoid.</p>			<p>speed fail compare when: diagnostic clutch test Cx ((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 FASLE (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</p> <p>accelerator pedal position engine speed</p> <p>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</p>	<p>= HOLDING CLUTCH = FALSE</p> <p>= TRUE</p> <p>≠ initial startle mitigation gear</p> <p>= FALSE</p> <p>= 0 Boolean</p> <p>= FALSE</p> <p>≥ 100.0 RPM</p> <p>≥ 2.00 % ≥ 1,500.0 RPM</p> <p>= NEUTRAL TEST = FALSE</p> <p>= TRUE</p> <p>≠ initial startle mitigation gear</p> <p>= mapped to line pressure, Cx clutch pressure has transtioned</p>		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>clutch select stuck on test active set to TRUE when: 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 position in normal operation, allowing hydraulic fluid to C3 (CB38) C4 (C4) and C5 (C57R) clutches</p> <p>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</p> <p>NOTE: startle mitigation active is used to detect unintended deceleration due to clutch pressure control solenoid stuck on</p>	<p>from off-applying-applied</p> <p>≠ REVERSE = NEUTRAL TEST</p> <p>= complete</p> <p>= TRUE</p> <p>= FALSE</p> <p>= CeCGSR_e_Fourth = CeCGSR_e_Fifth = CeCGSR_e_Fourth</p>		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					failure modes, the clutch pressure control solenoid stuck on DTCs being P0747 P0777 P0797 P2715 P2724 P2733 P2821 DTCs not fault pending DTCs not test fail this key on DTCs not fault active	P0716 P0717 P0722 P0723 P077C P077D P07BF P07C0 P0707 P0708 P0746 P0747 P0776 P0777 P0796 P0797 P2714 P2715 P2723 P2724 P2732 P2733 P2820 P2821 AcceleratorPedalFailure CrankSensor_FA P0707 P0708 P0716 P0717 P07BF P07C0 P0722 P0723 P077C P077D P172A P172B P176B P176C P176D P17C5 P17CC P17CD P17CE P17D3 P17D6 P2805		

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control Solenoid J Control Circuit Low	P2826	Controller specific circuit diagnoses 9 speed Clutch Select Valve Control Circuit or 10 speed PISA Valve Control 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (T87A - 9 Speed)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Pressure Control Solenoid J Control Circuit High	P2827	Controller specific circuit diagnoses 9 speed Clutch Valve Control Circuit or 10 speed PISA 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 Increment fail time	$\leq 0.5 \Omega$ impedance between signal and controller voltage source	battery voltage run crank voltage OR accessory voltage active diagnostic monitor enable calibration	≥ 8.00 volts and ≤ 32.00 volts ≥ 5.00 volts = TRUE = 1 Boolean	≥ 1.000 seconds 25 milliseconds 12.5 milliseconds fail time ≥ 0.300 seconds out of sample time ≥ 0.500 seconds	Type A, 1 Trips

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Transmission Fluid Temperature								
Transmission Fluid Temperature Sensor Circuit Range / Performance	P0711	This test detects performance of the transmission fluid temperature sensor by comparing changes in temperature from start up and between samples to calibration values.	All 5 Cases		Not Test Failed This Key On	P0711 P0716 P0717 P0721 P0722 P0742 P077C P077D P07BF P07C0		Type B, 2 Trips
					No Fault Pending DTCs for this drive cycle	P0716 P0717 P0721 P0722 P077C P077D P07BF P07C0		
					No Pass DTCs for this drive cycle	P0711		
					No Fault Active DTC	P0711		
					Components powered AND Battery Voltage ≥ 9 V Engine Speed between 200 RPM and 7500 RPM for 5 seconds Start-up transmission fluid temperature is available Transmission fluid temperature between -39 deg. C and 149 deg. C ECT is not defaulted			
		Case 1 (Stuck sensor after cold start-up)	Start-up temperature change ≤ 2 deg. C for a time ≥ 100 seconds AND Vehicle speed ≥ 8 KPH for a time ≥ 300 seconds.		Start-up transmission fluid temperature between -40 deg. C and 21 deg. C TCC Slip ≥ 120 RPM for a time ≥ 300 seconds engine coolant temperature ≥ 70 deg. C AND engine coolant temperature change from start-up ≥ 15 deg. C		300 seconds	
		Case 2 (Stuck sensor after warm start-up)	Start-up temperature change ≤ 3 deg. C for a time ≥ 100 seconds AND		Start-up transmission fluid temperature between 115 deg. C and 150 deg. C. TCC Slip ≥ 120 RPM for a time ≥ 300 seconds		300 seconds	

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			<p>Vehicle speed \geq 8 KPH for a time \geq 300 seconds.</p> <p>Case 3 (Noisy sensor) Change from previous temperature \geq 20 deg. C for \geq 14 events in a time $<$ 7 seconds.</p> <p>Case 4 (Doesn't warm up to at least 20 deg. C) Time Enabled Criteria met AND AND Transmission Fluid Temperature $<$ 20 deg. C.</p> <p>Time Enabled Criteria is determined by a lookup table ranging from 250 seconds when start-up temperature is \geq 20 deg. C to 2200 seconds when start-up temperature is \leq -40 deg. C.</p> <p>Case 5 (Reasonableness at start-up): Engine Speed $>$ 500 RPM AND Engine Coolant Temperature $>$ -39 deg. C AND $<$ 50 deg. C for \geq 2 seconds AND ((ABS(IAT-ECT) \leq 6 deg. C AND (TFT-ECT)) $>$ 40 deg. C OR (ABS(IAT-ECT) $>$ 6 deg. C AND (TFT-ECT))) $>$ 60 deg. C.</p>	<p>\geq 8 KPH \geq 300 seconds.</p> <p>\geq 20 deg. C \geq 14 events $<$ 7 seconds.</p> <p>$<$ 20 deg. C.</p> <p>250 seconds when start-up temperature is \geq 20 deg. C to 2200 seconds when start-up temperature is \leq -40 deg. C.</p> <p>$>$ 500 RPM AND $>$ -39 deg. C AND $<$ 50 deg. C for \geq 2 seconds AND \leq 6 deg. C AND $>$ 40 deg. C OR $>$ 6 deg. C AND $>$ 60 deg. C.</p>	<p>engine coolant temperature \geq 70 deg. C AND engine coolant temperature change from start-up \geq 55 deg. C</p> <p>net engine torque \geq 150 Nm and \leq 1492 Nm vehicle speed \geq 22 KPH and \leq 511 KPH %throttle \geq 10.0% and \leq 100% engine speed \geq 500 RPM and \leq 6500 RPM engine coolant temperature \geq -39 deg. C and \leq 149 deg. C</p> <p>Intake Air Temperature is not defaulted</p>	<p>\geq 70 deg. C AND \geq 55 deg. C</p> <p>\geq 150 Nm and \leq 1492 Nm \geq 22 KPH and \leq 511 KPH \geq 10.0% and \leq 100% \geq 500 RPM and \leq 6500 RPM \geq -39 deg. C and \leq 149 deg. C</p>	<p>7 seconds</p> <p>2200 seconds</p> <p>2 seconds</p>	
Transmission Fluid Temperature Sensor Circuit Low Input	P0712	Out of range low.	transmission fluid temperature	\geq 140 deg. C	Not Test Failed This Key On	P0711 P0712 P0713	2.5 seconds	Type B, 2 Trips
			for a time	$>$ 2.5 seconds.	Components powered AND Battery Voltage \geq 9 V			
					Engine Speed between 200 RPM and 7500 RPM for 5 seconds			
Transmission Fluid Temperature Sensor Circuit High Input	P0713	Out of range high.	transmission fluid temperature	\leq - 40 deg. C	Not Test Failed This Key On	P0711 P0712 P0713	2.5 seconds	Type B, 2 Trips
			for a time	$>$ 2.5 seconds	Components powered AND Battery Voltage \geq 9 V			
					Engine Speed between 200 RPM and 7500 RPM			

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
						for 5 seconds IF Engine run time <= 600 seconds THEN Engine Coolant Temperature must be > 20 deg. C AND not defaulted for a time >= 20 seconds.		
Speed Sensors								
Input/Turbine Speed Sensor Circuit Range/Performance	P0716	This test detects large changes in Input Speed and noisy Input Speed by comparing to calibration values.	All cases		Not Test Failed This Key On No Fault Pending DTCs for this drive cycle. Not Low Voltage Disable	P0716 P0717 P07BF P07C0		Type A, 1 Trip
			Case 1: (Unrealistically large changes in input speed) Change of Input Speed between samples >= 800 RPM for >= 0.15 seconds AND NOT Low Voltage Response			0.15 seconds		
			Case 2: (Noisy Input Speed) For sample size 80 IF the change in Input Speed <= -800 RPM THEN the Low Counter is incremented IF the change in Input Speed >= 800 RPM THEN the High Counter is incremented This test fails if both the Low Counter and the High Counter >= 5 OR Low Counter >= 5 OR High Counter >= 5			2 seconds		
Input/Turbine Speed Sensor Circuit No Signal	P0717	This test detects unrealistically low value of input/turbine speed or unrealistically large changes in input/turbine speed.	Failure pending if transmission input speed < 61 RPM This test fails if input speed < 61 RPM AND output speed > 500 RPM for a time > 1 second. AND NOT Low Voltage Response		Not Test Failed This Key On	P0717 P0729 P0731 P0732 P0733 P0734 P0735 P0736 P0721	1 second	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
						P0722 P0716 P07BF P07C0 P077C P077D No Fault Pending DTCs P0721 P0722 P07BF P07C0 P077C P077D NOT Low Voltage Disable Engine is running Reverse-to-Neutral shift not in process Shifting complete Range attained is not neutral Transmission fluid temperature > -25 deg. C Engine speed >= 400 RPM Transmission output speed >= 150 RPM		
Output Speed Sensor Circuit Range/Performance	P0721	This test detects a noisy output speed sensor or circuit by detecting large changes in output speed.	Case 1: (Unrealistically large change in output speed)	Change in output speed >= 500 RPM for a time >= 0.15 seconds AND NOT Low Voltage Response	All Cases Not Test Failed This Key On	P0721 P0722	Case 1: 0.15 seconds	Type A, 1 Trip
			Case 2: (Noisy output speed)	For sample size 80 IF the change in output speed <= -500 RPM THEN the Low Counter is incremented. IF the change in output speed >= 500 RPM THEN the High Counter is incremented. Test fails if both the Low Counter and High Counter are incremented >= 5 OR the Low Counter >= 5 OR the High Counter >= 5			No Fault Pending DTCs for this drive cycle P077C P077D NOT Low Voltage Disable range attained NOT neutral	
Output Speed Sensor Circuit No Signal	P0722	This test detects unrealistically low value of output speed or unrealistically large change in output speed.	All Cases		All Cases Not Test Failed This Key On	P0721 P0722 P077C P077D		Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
		malfunctions.	for THEN increment fail timer IF fail timer AND Engine Speed THEN report malfunction	0.2 second >= 4 counts >= 20 rpm	No Fault Active DTC Components powered AND Battery Voltage	P07BF >= 9 V		
Output Speed Sensor Ckt Voltage Low	P077C	This test detects either open or short to ground circuit malfunctions.	IF voltage for THEN increment fail timer IF fail timer AND Engine Speed AND NOT Low Voltage Response THEN report malfunction	<= 0.25 volts 0.2 second >= 4 counts >= 20 rpm	Not Test Failed This Key On OR No Fault Active DTC No Fault Active DTC NOT Low Voltage Disable	P077C P077C P077D	0.8 sec	Type A, 1 Trip
Output Speed Sensor Ckt Voltage High	P077D	This test detects either open or short to ground circuit malfunctions.	IF voltage for THEN increment fail timer IF fail timer AND Engine Speed THEN report malfunction	>= 4.75 0.2 second >= 4 counts >= 20 rpm	Not Test Failed This Key On OR No Fault Active DTC No Fault Active DTC Components powered AND Battery Voltage	P077D P077D P077C >= 9 V	0.8 sec	Type A, 1 Trip
Range Verification								
Gear 1 Incorrect Ratio	P0731	This test verifies transmission operating ratio while 1st range is commanded by comparing computed ratio to the commanded ratio.	Pending failure occurs when accumulated event timer IF main pressure dropout is suspected THEN accumulated event timer is IF main pressure dropout is detected THEN accumulated event timer is Timer accumulates when transmission is in forward or reverse range AND output speed AND gear slip In response to pending failure, a diagnostic response range is commanded. During this command, this test fails if Abs(Converter Slip) for	>= 2 second >= 1 second >= 0.75 second >= 100 RPM AND > 100 RPM >= 250 RPM > 10 samples.	Not Test Failed This Key On (except if dropout suspected or detected) Not Fault Pending with cmd gear Rev_Logic1 and RPS/PRNDL conflict Not Fault Active with cmd gear Rev_Logic1 and RPS/PRNDL conflict Not Test Failed This Key On No Fault Pending DTC for this drive cycle.	P0877 P0878 P0877 P0877 P0721 P0722 P0716 P0717 P07BF P07C0 P077C P077D P0717 P07BF P07C0	2.25 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					NOT Low Voltage Disable No range switch response active Hydraulic System Pressurized Shift complete Output speed \geq 200 RPM No hydraulic default condition present Normal powertrain shutdown not in process Normal powertrain initialization is complete			
Gear 2 Incorrect Ratio	P0732	This test verifies transmission operating ratio while 2nd range is commanded by comparing computed ratio to the commanded ratio.	Pending failure occurs when accumulated event timer IF main pressure dropout is suspected THEN accumulated event timer is IF main pressure dropout is detected THEN accumulated event timer is Timer accumulates when transmission is in forward or reverse range AND output speed \geq 100 RPM AND gear slip $>$ 100 RPM In response to pending failure, a diagnostic response range is commanded. During this command, this test fails if Abs(Converter Slip) \geq 250 RPM for $>$ 10 samples.	\geq 2 second \geq 1 second \geq 0.75 second	Not Test Failed This Key On (except if dropout suspected or detected) Not Fault Pending with cmd gear Rev_Logic1 and RPS/PRNDL conflict Not Fault Active with cmd gear Rev_Logic1 and RPS/PRNDL conflict Not Test Failed This Key On No Fault Pending DTC for this drive cycle. NOT Low Voltage Disable No range switch response active Hydraulic System Pressurized Shift complete Output speed \geq 200 RPM	P0877 P0878 P0877 P0877 P0721 P0722 P0716 P0717 P07BF P07C0 P077C P077D P0717 P07BF P07C0	2.25 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					No hydraulic default condition present Normal powertrain shutdown not in process Normal powertrain initialization is complete			
Gear 3 Incorrect Ratio	P0733	This test verifies transmission operating ratio while 3rd range is commanded by comparing computed ratio to the commanded ratio.	Pending failure occurs when accumulated event timer IF main pressure dropout is suspected THEN accumulated event timer is IF main pressure dropout is detected THEN accumulated event timer is Timer accumulates when transmission is in forward or reverse range AND output speed ≥ 100 RPM AND gear slip > 100 RPM In response to pending failure, a diagnostic response range is commanded. During this command, this test fails if Abs(Converter Slip) ≥ 250 RPM for > 10 samples.	≥ 2 second ≥ 1 second ≥ 0.75 second	Not Test Failed This Key On (except if dropout suspect or detected) Not Fault Pending with cmd gear Rev_Logic1 and RPS/PRNDL conflict Not Fault Active with cmd gear Rev_Logic1 and RPS/PRNDL conflict Not Test Failed This Key On No Fault Pending DTC for this drive cycle. NOT Low Voltage Disabled No range switch response active Hydraulic System Pressurized Shift complete Output speed ≥ 200 RPM No hydraulic default condition present Normal powertrain shutdown not in process Normal powertrain initialization is complete	P0877 P0878 P0877 P0877 P0721 P0722 P0716 P0717 P07BF P07C0 P077C P077D P0717 P07BF P07C0	2.25 seconds	Type A, 1 Trip
Gear 4 Incorrect Ratio	P0734	This test verifies transmission	Pending failure occurs when accumulated event timer	≥ 2 second	Not Test Failed This Key On (except	P0877	2.25 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
		operating ratio while 4th range is commanded by comparing computed ratio to the commanded ratio.	<p>IF main pressure dropout is suspected THEN accumulated event timer is</p> <p>IF main pressure dropout is detected THEN accumulated event timer is</p> <p>Timer accumulates when transmission is in forward or reverse range</p> <p>AND output speed >= 100 RPM AND gear slip > 100 RPM</p> <p>In response to pending failure, a diagnostic response range is commanded.</p> <p>During this command, this test fails if Abs(Converter Slip) >= 250 RPM for > 10 samples.</p>	<p>>= 1 second</p> <p>>= 0.75 second</p>	<p>if dropout suspect or detected.)</p> <p>Not Fault Pending with cmd gear Rev_Logic1 and RPS/PRNDL conflict</p> <p>Not Fault Active with cmd gear Rev_Logic1 and RPS/PRNDL conflict</p> <p>Not Test Failed This Key On</p> <p>No Fault Pending DTC for this drive cycle.</p> <p>NOT Low Voltage Disabled</p> <p>No range switch response active</p> <p>Hydraulic System Pressurized</p> <p>Shift complete</p> <p>Output speed >= 200 RPM</p> <p>No hydraulic default condition present</p> <p>Normal powertrain shutdown not in process</p> <p>Normal powertrain initialization is complete</p>	<p>P0878</p> <p>P0877</p> <p>P0877</p> <p>P0721 P0722 P0716 P0717 P07BF P07C0 P077C P077D</p> <p>P0717 P07BF P07C0</p>		
Gear 5 Incorrect Ratio	P0735	This test verifies transmission operating ratio while 5th range is commanded by comparing computed ratio to the commanded ratio.	<p>Pending failure occurs when accumulated event timer</p> <p>IF main pressure dropout is suspected THEN accumulated event timer is</p> <p>IF main pressure dropout is detected THEN accumulated event timer is</p> <p>Timer accumulates when transmission is in forward or reverse range</p> <p>AND output speed >= 100 RPM gear slip > 100 RPM</p> <p>In response to pending failure, a diagnostic response range is</p>	<p>>= 2 second</p> <p>>= 1 second</p> <p>>= 0.75 second</p>	<p>Not Test Failed This Key On (except if dropout suspect or detected.)</p> <p>Not Fault Pending with cmd gear Rev_Logic1 and RPS/PRNDL conflict</p> <p>Not Fault Active with cmd gear Rev_Logic1 and RPS/PRNDL conflict</p> <p>Not Test Failed This Key On</p>	<p>P0877 P0878</p> <p>P0877</p> <p>P0877</p> <p>P0721 P0722</p>	2.25 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			<p>commanded.</p> <p>During this command, this test fails if Abs(Converter Slip) \geq 250 RPM for $>$ 10 samples.</p>		<p>No Fault Pending DTC for this drive cycle.</p> <p>NOT Low Voltage Disabled</p> <p>No range switch response active</p> <p>Hydraulic System Pressurized</p> <p>Shift complete</p> <p>Output speed \geq 200 RPM</p> <p>No hydraulic default condition present</p> <p>Normal powertrain shutdown not in process</p> <p>Normal powertrain initialization is complete</p>	<p>P0716 P0717 P07BF P07C0 P077C P077D</p> <p>P0717 P07BF P07C0</p>		
Reverse Incorrect Ratio	P0736	This test verifies transmission range while reverse range is commanded by comparing computed ratio to the commanded ratio.	<p>Accumulated event timer \geq 2 seconds</p> <p>IF main pressure dropout is suspected THEN accumulated event timer is \geq 1 second</p> <p>IF main pressure dropout is detected THEN accumulated event timer is \geq 0.75 second</p> <p>Timer accumulates when transmission is in forward or reverse range AND output speed \geq 100 RPM AND gear slip $>$ 100 RPM</p>		<p>Not Test Failed This Key On (except if dropout suspect or detected.)</p> <p>Not Fault Pending with cmd gear Rev_Logic1 and RPS/PRNDL conflict</p> <p>Not Fault Active with cmd gear Rev_Logic1 and RPS/PRNDL conflict</p> <p>Not Test Failed This Key On</p> <p>No Fault Pending DTC for this drive cycle.</p> <p>NOT Low Voltage Disabled</p>	<p>P0877 P0878</p> <p>P0877</p> <p>P0877</p> <p>P0721 P0722 P0716 P0717 P07BF P07C0 P077C P077D</p> <p>P0717 P07BF P07C0</p>	2 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					No range switch response active Hydraulic System Pressurized Shift complete Output speed \geq 200 RPM No hydraulic default condition present Normal powertrain shutdown not in process Normal powertrain initialization is complete			
Gear 6 Incorrect Ratio	P0729	This test verifies transmission range while 6th range is commanded by comparing computed ratio to the commanded ratio.	Pending failure occurs when accumulated event timer \geq 2 second IF main pressure dropout is suspected THEN accumulated event timer is \geq 1 second IF main pressure dropout is detected THEN accumulated event timer is \geq 0.75 second Timer accumulates when transmission is in forward or reverse range AND output speed \geq 100 RPM AND gear slip $>$ 100 RPM In response to pending failure, a diagnostic response range is commanded. During this command, this test fails if Abs(Converter Slip) \geq 250 RPM for $>$ 10 samples.		Not Test Failed This Key On (except if dropout suspect or detect) Not Fault Pending with cmd gear Rev_Logic1 and RPS/PRNDL conflict Not Fault Active with cmd gear Rev_Logic1 and RPS/PRNDL conflict Not Test Failed This Key On No Fault Pending DTC for this drive cycle. NOT Low Voltage Disable No range switch response active Hydraulic System Pressurized Shift complete Output speed \geq 200 RPM No hydraulic default condition present Normal powertrain shutdown not in process	P0877 P0878 P0877 P0877 P0721 P0722 P0716 P0717 P07BF P07C0 P077C P077D P0717 P07BF P07C0	2.25 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					Normal powertrain initialization is complete			
Torque Converter								
Torque Converter Clutch Circuit Performance or Stuck Off	P0741	This test detects the torque converter being stuck off (unlocked).	TCC Slip for a time	>= 80 RPM >= 15 seconds.	Not Test Failed This Key On No Fault Pending DTCs for this drive cycle.	P2761 P2763 P2764 P0721 P0722 P0716 P0717 P077C P077D P07BF P07C0 P2761 P2763 P2764 P0721 P0722 P0716 P0717 P077C P077D P07BF P07C0	15 seconds	Type B, 2 Trips
					Components powered AND Battery Voltage >= 9 V Engine Speed between 200 RPM and 7500 RPM for 5 seconds Must be in forward range % Throttle > 10 % and <= 90 % Transmission fluid temperature > 5 deg. C and < 130 deg. C Time Since Range Change >= 6 seconds AND TCC apply is complete AND TCC pressure >= 1000 kPa			
Torque Converter Clutch Circuit Stuck On	P0742	This test detects the torque converter being stuck on (locked).	Case 1: (High Torque condition) Set fault pending when throttle AND net engine torque	>= 70% >= 275 Nm.	Not Test Failed This Key On	P2761 P2763 P2764 P0721 P0722 P0716	Case 1: 2 Seconds	Type A, 1 Trip
			Report malfunction when fault pending					

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			exists continuously for a time	≥ 2 seconds.		P0717 U0100 P077C P077D P07BF P07C0		
			Case 2: (High Acceleration condition) Set fault pending when output shaft acceleration	≥ 100 RPM/second	No Fault Pending DTCs for this drive cycle.	P2761 P2763 P2764 P0721 P0722 P0716 P0717 U0100 P077C P077D P07BF P07C0	Case 2: 5 Seconds	
			Report malfunction when fault pending exists continuously for a time	≥ 5 seconds.				
			Case 3: (Accel/Decel/Accel condition) Report malfunction when output acceleration event is followed by output deceleration event and followed by another output acceleration event. An output acceleration event occurs when output shaft acceleration	≥ 40 RPM/second ≥ 4 seconds	Components powered AND Battery Voltage	≥ 9 V	Case 3: 4 Seconds	
			An output deceleration event occurs when output shaft acceleration is	≤ -40 RPM/second for a time ≥ 2.5 seconds.	Engine Speed between 200 RPM and 7500 RPM for 5 seconds Engine speed not defaulted Must be in forward range TCC is commanded off TCC Slip	≥ -20 RPM and ≤ 20 RPM		
					% Throttle Net Engine Torque Engine speed Input speed Output speed	$\geq 25\%$ ≥ 175 Nm ≤ 3500 RPM ≤ 3500 RPM ≥ 100 RPM		
Pressure Switches								
Pressure Switch Solenoid 1 Circuit Low	P0842	This test compares the commanded valve position to the PS1 pressure switch feedback. (part of S1 valve integrity test)	Pending failure occurs when PS1 pressure switch indicates stroked for a time	> 0.08 seconds	S1 valve is destroyed NOT Cold initialization unless transmission fluid temperature	> -25 deg. C NOT Low Voltage Disable NOT Shutdown with Active Diag Hydraulic System Pressurized NOT Hydraulic Default Cmd	80 ms	Type A, 1 Trip
			In response to the pending failure, S1 valve is retried by triggering S1 valve command to stroked and back to destroyed. If PS1 pressure switch continues to indicate stroked, then one of three malfunction cases exists:					

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			<p>For Case 1 (electrical malfunction),</p> <p style="padding-left: 40px;">SS1 Circuit Low reports failure, also.</p> <p>For Case 2 (mechanical malfunction),</p> <p style="padding-left: 40px;">Shift Solenoid 1 (SS1) Valve Performance – Stuck On reports failure, also.</p> <p>For Case 3 (intermittent malfunction),</p> <p style="padding-left: 40px;">SS1 valve retry attempted</p> <p style="padding-left: 80px;">AND</p> <p style="padding-left: 40px;">PS1 pressure switch continues to indicate stroked.</p>	<p>P0973</p> <p>P0752</p> <p>15 times</p>				
Shift Solenoid 1 (SS1) Valve Performance – Stuck Off	P0751	This test compares the change of state of the valve command to the change of state of the PS1 pressure switch feedback. (part of the S1 valve timeout test)	<p>S1 valve is commanded from destroyed to stroked and the PS1 pressure switch indication remains destroyed for a time</p> <p style="padding-left: 40px;">WITH</p> <p style="padding-left: 40px;">transmission fluid temperature</p> <p>(Time increases as temperature decreases with maximum time at transmission fluid temperature)</p>	<p>≥ 5 seconds</p> <p>≥ 0 deg. C</p> <p>12 seconds</p> <p>≤ -40 deg. C</p>	<p>S1 valve commanded from destroyed</p> <p style="padding-left: 40px;">NOT Low Voltage Disable</p> <p style="padding-left: 40px;">NOT Shutdown with Active Diag</p> <p style="padding-left: 40px;">Hydraulic System Pressurized</p> <p style="padding-left: 40px;">NOT Hydraulic Default Cmd</p>		5 seconds	Type A, 1 Trip
Shift Solenoid 1 (SS1) Valve Performance – Stuck On	P0752	This test compares the change of state of the valve command to the change of state of the PS1 pressure switch feedback. (part of the S1 valve timeout test).	<p>S1 valve commanded from stroked to destroyed and the PS1 pressure switch indication remains stroked for a time</p> <p style="padding-left: 40px;">WITH</p> <p style="padding-left: 40px;">transmission fluid temperature</p> <p>(Time increases as temperature decreases with maximum time at transmission fluid temperature)</p>	<p>> 6.2 seconds</p> <p>≥ 0 deg. C.</p> <p>10 seconds</p> <p>≤ -40 deg. C</p>	<p>S1 valve commanded from stroked to destroyed</p> <p style="padding-left: 40px;">NOT Low Voltage Disable</p> <p style="padding-left: 40px;">NOT Shutdown with Active Diag</p> <p style="padding-left: 40px;">Hydraulic System Pressurized</p> <p style="padding-left: 40px;">NOT Hydraulic Default Cmd</p>		6.6 seconds	Type A, 1 Trip
Pressure Switch Solenoid 1 Circuit High	P0843	This test compares the commanded valve position to the PS1 pressure switch feedback. (part of S1 valve integrity test)	<p>Pending failure occurs when PS1 pressure switch indicates destroyed for a time</p> <p style="padding-left: 40px;">IF a main pressure dropout is suspected then time limit increases to</p> <p>In response to the pending failure, S1 valve is retried by triggering S1 valve command to destroyed and back to stroked. If the PS1 pressure switch continues to indicate destroyed, then one of three malfunction cases exists.</p>	<p>> 0.07 seconds</p> <p>5 seconds</p>	<p>S1 valve is stroked</p> <p style="padding-left: 40px;">NOT Cold initialization unless transmission fluid temperature</p> <p style="padding-left: 40px;">NOT Low Voltage Disable</p> <p style="padding-left: 40px;">NOT Shutdown with Active Diag</p> <p style="padding-left: 40px;">Hydraulic System Pressurized</p> <p style="padding-left: 40px;">NOT Hydraulic Default Cmd</p>	<p>> -25 deg. C</p>	70 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			<p>For Case 1 (electrical malfunction),</p> <p style="padding-left: 40px;">SS1 Control Circuit Low reports failure, also.</p> <p>For Case 2 (mechanical malfunction),</p> <p style="padding-left: 40px;">Shift Solenoid 1 (SS1) Valve Performance – Stuck Off reports failure, also.</p> <p>For Case 3 (intermittent malfunction),</p> <p style="padding-left: 40px;">S1 valve retry attempted 15 times AND PS1 pressure switch continues to indicate destroyed.</p>	<p>P0973</p> <p>P0751</p>				
Pressure Switch Solenoid 2 Circuit Low	P0847	This test compares the commanded valve position to the PS2 pressure switch feedback (part of the S2 valve integrity test).	<p>Pending failure occurs when PS2 pressure switch indicates stroked for a time > 0.04004 seconds</p> <p>IF a main pressure dropout is suspected then time limit increases to 0.2998 seconds</p> <p>In response to the pending failure, S2 valve is retried by triggering S2 valve command to stroked and back to destroyed. If PS2 pressure switch continues to indicate stroked, then one of three malfunction cases exists.</p> <p>For Case 1 (electrical malfunction),</p> <p style="padding-left: 40px;">SS2 Control Circuit Low reports failure, also.</p> <p>For Case 2 (mechanical malfunction),</p> <p style="padding-left: 40px;">Shift Solenoid 2 Valve Performance – Stuck On reports failure, also.</p> <p>For Case 3 (intermittent malfunction),</p> <p style="padding-left: 40px;">S2 valve retry attempted 2 times AND PS2 pressure switch continues to indicate stroked.</p>	<p>> 0.04004 seconds</p> <p>0.2998 seconds</p>	<p>S2 valve is destroyed</p> <p>NOT Cold initialization unless transmission fluid temperature > -25 deg. C</p> <p>NOT Low Voltage Disabled</p> <p>NOT Shutdown with Active Diagnostic</p> <p>Hydraulic System Pressurized</p> <p>NOT Hydraulic Default Command</p>		40 ms	Type A, 1 Trip
Shift Solenoid 2 Valve Performance – Stuck Off	P0756	This test compares the change of state of the valve command to the change of state of	<p>If the S2 valve is commanded from destroyed to stroked and the PS2 pressure switch indication remains destroyed for a time >= 5 seconds</p>	>= 5 seconds	<p>S2 valve commanded from destroyed to stroked.</p> <p>NOT Low Voltage Disabled</p>		5 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
		change of state of the PS2 pressure switch feedback (part of the S2 valve timeout test).	WITH transmission fluid temperature (Time increases as temperature decreases with maximum time at transmission fluid temperature)	>= 0 deg. C. 12 seconds <= -40 deg. C.	NOT Shutdown with Active Diag Hydraulic System Pressurized NOT Hydraulic Default Cmd			
Shift Solenoid 2 Valve Performance – Stuck On	P0757	This test compares the commanded valve position to the PS2 pressure switch feedback (part of the S2 valve timeout test).	S2 valve commanded from stroked to destroyed and the PS2 pressure switch does not indicate destroyed for a time WITH transmission fluid temperature (Time increases as temperature decreases with maximum time at transmission fluid temperature)	>= 6.5 seconds >= 0 deg. C. 22 seconds <= -40 deg. C.	S2 valve commanded from stroked to destroyed NOT Low Voltage Disable NOT Shutdown with Active Diag Hydraulic System Pressurized NOT Hydraulic Default Cmd		6.5 sec	Type A, 1 Trip
Pressure Switch Solenoid 2 Circuit High	P0848	This test compares the commanded valve position to the PS2 pressure switch feedback (part of the S2 valve integrity test).	Pending failure occurs when PS2 pressure switch indicates destroyed for a time IF a main pressure dropout is suspected, THEN time limit increases to In response to the pending failure, S2 valve is retried by triggering S2 valve command to destroyed and back to stroked. If PS2 pressure switch continues to indicate destroyed, then one of three malfunction cases exists. For Case 1 (electrical malfunction), SS2 Control Circuit Low reports failure, also. P0976 For Case 2 (mechanical malfunction), Shift Solenoid 2 Valve Performance – Stuck Off reports failure, also. P0756 For Case 3 (intermittent malfunction), S2 valve retry attempted AND PS2 pressure switch continues to indicate destroyed.	> 0.30 seconds 5 seconds 2 times	S2 valve is stroked NOT Cold initialization unless transmission fluid temperature NOT Low Voltage Disable NOT Shutdown with Active Diag Hydraulic System Pressurized NOT Hydraulic Default Cmd	> -25 deg. C	300 ms	Type A, 1 Trip
Pressure Switch Solenoid 3 Circuit Low	P0872	This test compares the commanded valve position to the PS3 pressure switch feedback. (part of	Pending failure occurs when PS3 pressure switch indicates stroked for a time	> 0.0195 seconds	S3 valve is destroyed NOT Cold initialization unless transmission fluid temperature	> -25 deg. C	20 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
		S3 valve integrity test)	<p>In response to the pending failure, S3 valve is retried by triggering S3 valve command to stroked and back to destroyed. If PS3 pressure switch continues to indicate stroked, then one of three malfunction cases exists.</p> <p>For Case 1 (electrical malfunction),</p> <p>SS3 Control Circuit Low reports failure, also. P0979</p> <p>For Case 2 (mechanical malfunction),</p> <p>Shift Solenoid 3 Valve Performance – Stuck On reports failure, also. P0762</p> <p>For Case 3 (intermittent malfunction),</p> <p>S3 valve retry attempted 2 times AND PS3 pressure switch continues to indicate stroked.</p>		<p>NOT Low Voltage Disable</p> <p>NOT Shutdown with Active Diag</p> <p>Hydraulic System Pressurized</p> <p>NOT Hydraulic Default Cmd</p>			
Shift Solenoid 3 Valve Performance – Stuck Off	P0761	This test compares the change of state of the valve command to the change of state of the PS3 pressure switch feedback. (part of the S3 valve timeout test)	<p>If the S3 valve is commanded from destroyed to stroked and the PS3 pressure switch indication remains destroyed for a time</p> <p>WITH transmission fluid temperature</p> <p>(Time increases as temperature decreases with maximum time at transmission fluid temperature)</p>	<p>≥ 5 seconds</p> <p>≥ 0 deg. C.</p> <p>12 seconds</p> <p>at ≤ -40 deg. C.</p>	<p>S3 valve commanded from destroyed to stroked.</p> <p>NOT Low Voltage Disable</p> <p>NOT Shutdown with Active Diag</p> <p>Hydraulic System Pressurized</p> <p>NOT Hydraulic Default Cmd</p>		5 seconds	Type A, 1 Trip
Shift Solenoid 3 Valve Performance – Stuck On	P0762	This test compares the commanded valve position to the PS3 pressure switch feedback (part of the S3 valve timeout test).	<p>S3 valve commanded from stroked to destroyed and the PS3 pressure switch does not indicate destroyed for a time</p> <p>WITH transmission fluid temperature</p> <p>(Time increases as temperature decreases with maximum time at transmission fluid temperature)</p>	<p>> 6.5 seconds</p> <p>≥ 0 deg. C.</p> <p>22 seconds</p> <p>at ≥ -40 deg. C.</p>	<p>S3 valve commanded from stroked to destroyed.</p> <p>NOT Low Voltage Disable</p> <p>NOT Shutdown with Active Diag</p> <p>Hydraulic System Pressurized</p> <p>NOT Hydraulic Default Cmd</p>		6.6 seconds	Type A, 1 Trip
Pressure Switch Solenoid 3 Circuit High	P0873	This test compares the commanded valve position to the pressure switch PS3 feedback. (part of S3 valve integrity test)	<p>Pending failure occurs when PS3 pressure switch indicates destroyed for a time</p> <p>IF a main pressure dropout is suspected THEN time limit increases to</p>	<p>> 0.30 seconds</p> <p>5 seconds</p>	<p>S3 valve is stroked</p> <p>NOT Cold initialization unless transmission fluid temperature > -25 deg. C</p> <p>NOT Low Voltage Disable</p>		300 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			<p>In response to the pending failure, S3 valve is retried by triggering S3 valve command to destroyed and back to stroked. If PS3 pressure switch continues to indicate destroyed, then one of the three malfunction cases exists.</p> <p>For Case 1 (electrical malfunction), SS3 Control Circuit Low reports failure, also.</p> <p>For Case 2 (mechanical malfunction), Shift Solenoid 3 Valve Performance – Stuck Off reports failure, also.</p> <p>For Case 3 (intermittent malfunction), S3 valve retry attempted 2 times AND PS3 pressure switch continues to indicate destroyed.</p>	<p>P0979</p> <p>P0761</p>	<p>NOT Shutdown with Active Diag</p> <p>Hydraulic System Pressurized</p> <p>NOT Hydraulic Default Cmd</p>			
Pressure Switch Reverse Circuit Low	P0877	This test detects Reverse Pressure Switch closed indication by comparing the Reverse Pressure Switch state to the PRNDL switch state.	<p>Case 1: (Forward range) For a sample size 100 samples (if dropout suspected, NLT or N02 cmded, use sample size) 255 samples</p> <p>PRNDL is P, D1, D2, D3, D4, D5, D6, T8, or T4 AND RPS indicates Reverse for a time >= 1 seconds (if dropout suspected, NLT or N02 cmded, use time) 30 seconds</p> <p>Case 2: (Range indefinite) For a sample size, 20 samples net engine torque >= 100 Nm AND PRNDL is indefinitely D3 or another forward range for a time > 1 second</p>		<p>All Cases Not Test Failed This Key On</p> <p>No Fault Pending DTCs for this drive cycle</p> <p>Engine had been cranking or running this drive cycle Components powered AND Ignition Voltage between 9 V and 18 V Engine Speed between 200 RPM and 7500 RPM for 5 seconds Transmission Fluid Temperature >= 0 deg. C Hydraulic System Pressurized Reverse Pressure Switch State indicates REVERSE</p>	<p>P0877 P0878 P0708 P0708</p>	5 seconds	Type A, 1 Trip
Pressure Switch Reverse Circuit High	P0878	This test detects the Reverse Pressure switch being stuck in the open position by comparing to the PRNDL switch state	All Cases		<p>Not Test Failed This Key On</p> <p>No Fault Pending DTC for this drive cycle.</p>	<p>P0877 P0878 P0708 P0708</p>		Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					No Cold Mode operation No abusive garage shift to 1st range detected On-coming clutch control enabled Power downshift abort to previous range NOT active NOT Low Voltage Disable			
Pressure Control Solenoid 2 Controlled Clutch Stuck Off	P0776	This test determines if the on-coming clutch energized by Pressure Control Solenoid 2 engages during a forward range shift.	Pending failure occurs when accumulated event timer (For rough road conditions, use) Timer accumulates when transmission is shifting, output speed AND commanded gear slip speed (For rough road conditions, use) In response of pending failure, a diagnostic response range is commanded. During this command, this test fails if ABS(Converter slip) for sample size	≥ 2 seconds 2 seconds ≥ 60 RPM > 75 RPM 150 RPM. ≥ 250 RPM > 10 samples	Not Test Failed This Key On Output Speed Turbine Speed Hydraulic System Pressurized Normal powertrain shutdown not in process Normal or Cold powertrain initialization is complete No range switch response active No Cold Mode operation No abusive garage shift to 1st range detected On-coming clutch control enabled Power downshift abort to previous range NOT active NOT Low Voltage Disable	P0721 P0722 P0716 P0717 P0877 P0878 P07BF P07C0 P077C P077D ≥ 125 RPM ≥ 60 RPM	2.25 seconds	Type A, 1 Trip
Pressure Control Solenoid 1 Controlled Clutch Stuck On	P2724	This test determines if the off-going clutch energized by Pressure Control solenoid 1 remains	Accumulated fail timer for forward range upshift; OR accumulated fail timer for direction change shifts;	≥ 0.2998 seconds ≥ 3.0 seconds	Not Test Failed This Key On	P0721 P0722 P0716 P0717	3 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
		engaged during a forward range shift.	<p>OR accumulated fail timer for forward range closed throttle downshift;</p> <p>OR accumulated fail timer for forward downshifts above closed throttle.</p> <p>Fail timer accumulates during range to range shifts when attained gear slip speed</p>	<p>>= 0.500 seconds</p> <p>>= 1.0 second</p> <p><= 25 RPM</p>	<p>Output Speed</p> <p>Turbine Speed</p> <p>Normal powertrain shutdown not in process</p> <p>Normal or Cold powertrain initialization is complete</p> <p>No range switch response active</p> <p>No Cold Mode operation</p> <p>No abusive garage shift to 1st range detected</p> <p>NOT Low Voltage Disable</p>	<p>P0877</p> <p>P0878</p> <p>P07BF</p> <p>P07C0</p> <p>P077C</p> <p>P077D</p> <p>>= 200 RPM</p> <p>>= 200 RPM</p>		
Pressure Control Solenoid 2 Controlled Clutch Stuck On	P0777	This test determines if the off-going clutch energized by Pressure Control solenoid 2 remains engaged during a forward range shift.	<p>Accumulated fail timer for forward range upshift;</p> <p>OR accumulated fail timer for direction change shifts;</p> <p>OR accumulated fail timer for forward range closed throttle downshift;</p> <p>OR accumulated fail timer for forward downshifts above closed throttle.</p> <p>Fail timer accumulates during range to range shifts when attained gear slip speed</p>	<p>>= 0.2998 seconds</p> <p>>= 3.0 seconds</p> <p>>= 0.500 seconds</p> <p>>= 1.0 second</p> <p><= 25 RPM</p>	<p>Not Test Failed This Key On</p> <p>Output Speed</p> <p>Turbine Speed</p> <p>Normal powertrain shutdown not in process</p> <p>Normal or Cold powertrain initialization is complete</p> <p>No range switch response active</p> <p>No Cold Mode operation</p> <p>No abusive garage shift to 1st range detected</p> <p>NOT Low Voltage Disable</p>	<p>P0721</p> <p>P0722</p> <p>P0716</p> <p>P0717</p> <p>P0877</p> <p>P0878</p> <p>P07BF</p> <p>P07C0</p> <p>P077C</p> <p>P077D</p> <p>>= 200 RPM</p> <p>>= 200 RPM</p>	3 seconds	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
PRNDL/IMS								
Transmission Range Sensor High Input	P0708	This test monitors the transmission range switch for invalid input conditions and parity errors occurring over consecutive ignition cycles.	<p>For Case 1 (No Information): Illegal electrical state for a time</p> <p>For Case 2 (Long-term Parity): There are 3 counters for long-term parity. These counters are updated at the end of each drive cycle, immediately prior to TCM shutdown.</p> <p>For Counter 1, increment counter IF Parity Error Detected; decrement counter IF No Parity Error Detected AND No Motion Detected.</p> <p>IF Counter 1 THEN report failure.</p> <p>For Counter 2, increment counter IF Parity Error Detected AND (No Valid Drive Detected OR No Valid Park/Neutral Detected) AND Motion Detected; decrement counter IF No Parity Error Detected AND Valid Park/Neutral Detected AND Valid Drive Detected AND Motion Detected.</p> <p>IF Counter 2, THEN report failure.</p> <p>For Counter 3, increment Counter 3 IF Parity Error Detected while in Reverse AND No Valid Reverse Detected AND Motion Detected. Decrement Counter 3 IF No Parity Error Detected AND Valid Reverse Detected AND Motion Detected.</p> <p>IF Counter 3, THEN report failure.</p> <p>Where Parity Error Detected is defined as a failure of the 4-bit PRNDL input such that the sum of those bits yields an odd result for a time;</p> <p>Motion Detected is defined as output speed for a time;</p> <p>Valid Drive Detected is defined as the 4 bit DL indicates Valid Drive for a time;</p>	<p>>= 1 second</p> <p>>= 15 counts</p> <p>>= 5 counts</p> <p>>= 5 counts</p> <p>>= 30 seconds;</p> <p>>= 200 RPM >= 10 seconds</p>	<p>Components powered AND Battery Voltage Engine Speed between for</p>	<p>>= 9 V</p> <p>200 RPM and 7500 RPM</p> <p>5 seconds</p>	<p>Case 1: 1 second</p> <p>Case 2: 5th occurrence</p>	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			<p>Valid Park Detected is defined as the 4-bit PRNDL indicates Valid Park for a time ≥ 0.2 seconds and output speed ≤ 20 RPM</p> <p>Valid Reverse Detected is defined as the 4-bit PRNDL indicates Valid Reverse for a time ≥ 15 seconds;</p> <p>Valid Neutral Detected is defined as the 4-bit PRNDL indicates Valid Neutral for a time ≥ 0.2 seconds and output speed ≤ 20 RPM OR for a time ≥ 3 seconds</p>	<p>≥ 3 seconds</p>				
Transmission Range Sensor Circuit Range/Performance	P0706	This test monitors the transmission range switch inputs at engine start to determine that it is indicating a valid starting position (Park or Neutral).	For sample size, PRNDL C input is closed OR PRNDL P is NOT closed.	> 7 samples	<p>Not Test Failed This Key On</p> <p>Ignition voltage between 9V and 18 V</p> <p>Powertrain State is READY or CRANKING</p> <p>Engine speed > 100 RPM and < 350 RPM.</p>	P0706	200 ms	Type B, 2 Trips
Solenoid Electrical								
Main Modulation/Line Pressure Control Solenoid Control Circuit Open	P0960	This test detects solenoid electrical open circuit malfunctions.	Fault pending is set on a single occurrence of hardware ground or open fault.	<p>A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.01 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p> <p>An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance ≥ 173 kohm and shall not be detected if the circuit impedance is ≤ 9.6 k ohm. The interface shall detect an open circuit condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p>			125 ms	Type A, 1 Trip
					Not Test Failed This Key On	P2669		

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			<p>IF either hardware faults are present THEN initiate intrusive test by opening low side driver</p> <p>IF intrusive test indicates open for THEN report malfunction</p>	<p>>= 3 counts</p> <p>>= 2 counts</p>	<p>Components powered</p> <p>AND</p> <p>Battery Voltage >= 9 V</p> <p>If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V</p> <p>Engine speed >= 20 RPM</p> <p>High Side Driver 2 Enabled</p>	<p>P2670</p> <p>P2671</p>		
Main Modulation/Line Pressure Control Solenoid Control Circuit Performance	P0961	This test detects the performance of the solenoid by comparing desired current to actual duty cycle	<p>IF delta(desired current - actual current) FOR For a sample size THEN report malfunction</p>	<p>>= 0.5 amps</p> <p>>= 40 counts</p> <p>< 80 samples</p>	<p>Not Test Failed This Key On</p> <p>No Fault Pending DTC for this drive cycle.</p> <p>Components powered</p> <p>AND</p> <p>Battery Voltage >= 9 V</p> <p>If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V</p> <p>Engine speed >= 20 RPM</p> <p>High Side Driver 2 Enabled</p> <p>Shift Complete</p> <p>Lockup Apply Complete OR Lockup Release Complete</p>	<p>P2669</p> <p>P2670</p> <p>P2671</p> <p>P0960</p> <p>P0961</p> <p>P0962</p> <p>P0960</p> <p>P0962</p>	1000 ms	Type A,

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Main Modulation/Line Pressure Control Solenoid Control Circuit Low	P0962	This test detects solenoid electrical ground circuit malfunctions.	<p>Fault pending is set on a single occurrence of hardware ground or open fault.</p> <p>IF either hardware faults are present THEN initiate intrusive test by opening low side driver</p> <p>IF intrusive test indicates grnd for THEN report malfunction</p>	<p>A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.01 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p> <p>An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance ≥ 173 kohm and shall not be detected if the circuit impedance is ≤ 9.6 kohm. The interface shall detect an open circuit condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p>	<p>Not Test Failed This Key On</p> <p>Components powered</p> <p>AND</p> <p>Battery Voltage</p> <p>If Engine Cranking, then</p> <p>Crank Time</p> <p>AND</p> <p>Battery Voltage</p> <p>Engine speed</p> <p>High Side Driver 2 Enabled</p>	<p>P2669</p> <p>P2670</p> <p>P2671</p> <p>≥ 9 V</p> <p>< 4 seconds</p> <p>> 10 V</p> <p>≥ 20 RPM</p>	125 ms	Type A, 1 Trip
Main Modulation/Line Pressure Control Solenoid Control Circuit High	P0963	This test detects solenoid electrical short to power circuit malfunctions.		<p>A power short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 1.16 ohm to a voltage source within the Normal Operating Voltage Range or the High Operating Voltage Range. The interface shall detect a power short condition when the driver is On. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p>			75 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			Short to power fault present for	> = 3 counts	Not Test Failed This Key On Components powered AND Battery Voltage >= 9 V If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V Engine speed >= 20 RPM High Side Driver 2 Enabled	P2669 P2670 P2671		
Pressure Control Solenoid 2 Control Circuit Open	P0964	This test detects solenoid electrical open circuit malfunctions.	Fault pending is set on a single occurrence of hardware ground or open fault. IF either hardware faults are present THEN initiate intrusive test by opening low side driver IF intrusive test indicates open for THEN report malfunction	>= 3 counts >= 2 counts	A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance <= 0.01 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software. An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance >= 173 kohm and shall not be detected if the circuit impedance is <= 9.6 k ohm. The interface shall detect an open circuit condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software. Not Test Failed This Key On Components powered AND Battery Voltage >= 9 V If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V Engine speed >= 20 RPM High Side Driver 1 Enabled	P0657 P0658 P0659	125 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Pressure Control Solenoid 2 Control Circuit Performance	P0965	This test detects the performance of the solenoid by comparing desired current to actual duty cycle	<p>current) >= 0.5 amps FOR >= 10 counts</p> <p>For a sample size < 20 samples</p> <p>THEN report malfunction</p>		<p>Not Test Failed This Key On</p> <p>No Fault Pending DTC for this drive cycle.</p> <p>Components powered AND Battery Voltage >= 9 V</p> <p>If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V</p> <p>Engine speed >= 20 RPM</p> <p>High Side Driver 1 Enabled</p> <p>Shift Complete</p> <p>Lockup Apply Complete OR Lockup Release Complete</p>	<p>P0657 P0658 P0659 P0964 P0965 P0966</p> <p>P0964 P0966</p>	250ms	Type A,
Pressure Control Solenoid 2 Control Circuit Low	P0966	This test detects solenoid electrical ground circuit malfunctions.		<p>A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance <= 0.01 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software. An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance >= 173 kohm and shall not be detected if the circuit impedance is <= 9.6 k ohm. The interface shall detect an open circuit condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p> <p>Fault pending is set on a single occurrence of hardware ground or</p>		<p>Not Test Failed This Key On</p>	125 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Pressure Control Solenoid 1 Control Circuit Open	P2727	This test detects solenoid electrical open circuit malfunctions.	<p>A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.01 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software. An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance ≥ 173 k ohm and shall not be detected if the circuit impedance is ≤ 9.6 k ohm. The interface shall detect an open circuit condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p> <p>Fault pending is set on a single occurrence of hardware ground or open fault.</p> <p>IF either hardware faults are present THEN initiate intrusive test by opening low side driver</p> <p>IF intrusive test indicates open for THEN report malfunction</p>	<p>≥ 3 counts</p> <p>≥ 2 counts</p>	<p>Not Test Failed This Key On</p> <p>Components powered</p> <p>AND</p> <p>Battery Voltage ≥ 9 V</p> <p>If Engine Cranking, then</p> <p>Crank Time < 4 seconds</p> <p>AND</p> <p>Battery Voltage > 10 V</p> <p>Engine speed ≥ 20 RPM</p> <p>High Side Driver 2 Enabled</p>	<p>P2669</p> <p>P2670</p> <p>P2671</p>	125 ms	Type A, 1 Trip
Pressure Control Solenoid 1 Control Circuit Performance	P2728	This test detects the performance of the solenoid by comparing desired current to actual duty cycle	<p>current) ≥ 0.5 amps</p> <p>FOR ≥ 10 counts</p> <p>For a sample size < 20 samples</p> <p>THEN report malfunction</p>	<p>≥ 0.5 amps</p> <p>≥ 10 counts</p> <p>< 20 samples</p>	<p>Not Test Failed This Key On</p> <p>No Fault Pending DTC for this drive cycle.</p> <p>Components powered</p> <p>AND</p> <p>Battery Voltage ≥ 9 V</p> <p>If Engine Cranking, then</p>	<p>P2669</p> <p>P2670</p> <p>P2671</p> <p>P2727</p> <p>P2728</p> <p>P2729</p> <p>P2727</p> <p>P2729</p>	250 ms	Type A,

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
						Crank Time < 4 seconds AND Battery Voltage > 10 V Engine speed >= 20 RPM High Side Driver 2 Enabled Shift Complete Lockup Apply Complete OR Lockup Release Complete		
Pressure Control Solenoid 1 Control Circuit Low	P2729	This test detects solenoid electrical ground circuit malfunctions.		A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance <= 0.01 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software. An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance >= 173 k ohm and shall not be detected if the circuit impedance is <= 9.6 k ohm. The interface shall detect an open circuit condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.		Not Test Failed This Key On P2669 P2670 P2671 Components powered AND Battery Voltage >= 9 V If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V Engine speed >= 20 RPM High Side Driver 2 Enabled	125 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum	
Pressure Control Solenoid 1 Control Circuit High	P2730	This test detects solenoid electrical short to power circuit malfunctions.		A power short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 1.16 ohm to a voltage source within the Normal Operating Voltage Range or the High Operating Voltage Range. The interface shall detect a power short condition when the driver is On. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.	Short to power fault present for $> = 3$ counts	<p>Not Test Failed This Key On</p> <p>Components powered</p> <p>AND</p> <p>Battery Voltage ≥ 9 V</p> <p>If Engine Cranking, then</p> <p>Crank Time < 4 seconds</p> <p>AND</p> <p>Battery Voltage > 10 V</p> <p>Engine speed ≥ 20 RPM</p> <p>High Side Driver 2 Enabled</p>	<p>P2669</p> <p>P2670</p> <p>P2671</p> <p>P2730</p>	75 ms	Type A, 1 Trip
Shift Solenoid 1 Control Circuit Low/Open	P0973	This test detects solenoid electrical ground and open circuit malfunctions.		A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.42 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. The nominal filter time to latch fault is 200 usec and the diagnostic threshold is 240 usec. An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance ≥ 200 kohms and shall not be detected if the circuit impedance is ≤ 6 kohms. The interface shall detect an open circuit condition when the driver is Off. The nominal filter time to latch fault is 200 usec and the diagnostic threshold is 240 usec.	Fault pending is set on a single occurrence of hardware ground or open fault. IF either hardware fault is present for ≥ 10 counts	<p>Not Test Failed This Key On</p>	<p>P0657</p> <p>P0658</p> <p>P0659</p>	250 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			THEN report malfunction		Components powered AND Battery Voltage ≥ 9 V If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V Engine speed ≥ 20 RPM High Side Driver 1 Enabled			
Shift Solenoid 1 Control Circuit High	P0974	This test detects solenoid electrical short to power circuit malfunctions.	Short to power fault present for	≥ 3 counts	A power short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.39 ohm to a voltage source within the Normal Operating Voltage Range or the High Operating Voltage Range. The interface shall detect a power short condition when the driver is On. The nominal filter time to latch fault is 150 usec and the diagnostic threshold is 240 usec. Not Test Failed This Key On P0657 P0658 P0659 P0974 Components powered AND Battery Voltage ≥ 9 V If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V Engine speed ≥ 20 RPM High Side Driver 1 Enabled		75 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Shift Solenoid 2 Control Circuit Low/Open	P0976	This test detects solenoid electrical ground or open circuit malfunctions.		<p>A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.42 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. The nominal filter time to latch fault is 200 usec and the diagnostic threshold is 240 usec.</p> <p>An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance ≥ 200 kohms and shall not be detected if the circuit impedance is ≤ 6 kohms. The interface shall detect an open circuit condition when the driver is Off. The nominal filter time to latch fault is 200 usec and the diagnostic threshold is 240 usec.</p>	<p>Not Test Failed This Key On</p> <p>Components powered</p> <p>AND</p> <p>Battery Voltage ≥ 9 V</p> <p>If Engine Cranking, then</p> <p>Crank Time < 4 seconds</p> <p>AND</p> <p>Battery Voltage > 10 V</p> <p>Engine speed ≥ 20 RPM</p> <p>High Side Driver 1 Enabled</p>	<p>P0657</p> <p>P0658</p> <p>P0659</p>	250 ms	Type A, 1 Trip
Shift Solenoid 2 Control Circuit High	P0977	This test detects solenoid electrical short to power circuit malfunctions.		<p>IF either hardware fault is present for ≥ 10 counts</p> <p>THEN report malfunction</p>	<p>Short to power fault present for > 3 counts</p>	<p>Not Test Failed This Key On</p> <p>P0657</p> <p>P0658</p> <p>P0659</p>	75 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
						P0977 Components powered AND Battery Voltage $\geq 9\text{ V}$ If Engine Cranking, then Crank Time $< 4\text{ seconds}$ AND Battery Voltage $> 10\text{ V}$ Engine speed $\geq 20\text{ RPM}$ High Side Driver 1 Enabled		
Shift Solenoid 3 Control Circuit Low/Open	P0979	This test detects solenoid electrical ground or open circuit malfunctions.		A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance $\leq 0.22\text{ ohm}$ to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off . The nominal filter time to latch fault is 200 usec and the diagnostic threshold is 240 usec. An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance $\geq 200\text{ kohms}$ and shall not be detected if the circuit impedance is $\leq 6\text{ kohms}$. The interface shall detect an open circuit condition when the driver is Off. The nominal filter time to latch fault is 200 usec and the diagnostic threshold is 240 usec.			250 ms	Type A, 1 Trip
			Fault pending is set on a single occurrence of hardware ground or open fault. IF either hardware fault is present for $\geq 10\text{ counts}$ THEN report malfunction			Not Test Failed This Key On P0657 P0658 P0659 P0979 Components powered AND Battery Voltage $\geq 9\text{ V}$ If Engine Cranking, then Crank Time $< 4\text{ seconds}$ AND Battery Voltage $> 10\text{ V}$ Engine speed $\geq 20\text{ RPM}$ High Side Driver 1 Enabled		

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Shift Solenoid 3 Control Circuit High	P0980	This test detects solenoid electrical short to power circuit malfunctions.		A power short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.39 ohm to a voltage source within the Normal Operating Voltage Range or the High Operating Voltage Range. The interface shall detect a power short condition when the driver is On. The nominal filter time to latch fault is 150 usec and the diagnostic threshold is 240 usec.	Short to power fault present for $> = 3$ counts	Not Test Failed This Key On P0657 P0658 P0659 P0980 Components powered AND Battery Voltage ≥ 9 V If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V Engine speed ≥ 20 RPM High Side Driver 1 Enabled	75 ms	Type A, 1 Trip
Actuator Supply 1 (HSD1) Voltage Open	P0657	This test detects if the voltage measured at the HSD1 detection circuit shows that multiple low side detection circuits indicate open, but the high side detection circuit indicates high voltage.	IF HSD1 fault is indeterminate THEN initiate intrusive test Command intrusive gear. Override pressure control solenoid 2 THEN exit intrusive test after Report malfunction when the number of failure events	≥ 0.075 sec > 0.050 sec ≥ 3 ≥ 2	Not Test Failed This Key On HSD1 is commanded ON Components powered AND Battery Voltage ≥ 9 V If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V Engine speed ≥ 20 RPM	75 ms	Type A, 1 Trip	

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Actuator Supply 1 (HSD1) Voltage Low	P0658	This test detects low voltage when high voltage is expected indicating a short to ground at the circuit.	Report malfunction when short to ground is detected for a number of events	≥ 3 times		Not Test Failed This Key On HSD1 is commanded ON	75 ms	Type A, 1 Trip
Actuator Supply 1 (HSD1) Voltage High	P0659	This test detects if the voltage measured at the HSD 1 detection circuit indicates high during initialization (when the circuit is off)	During initialization, report malfunction when the number of failure events	≥ 3 times		During initialization Battery Voltage $\geq 9V$	18.75 ms	Type A, 1 Trip
Actuator Supply2 (HSD2) Voltage Open	P2669	This test detects if the voltage measured at the HSD2 detection circuit shows that multiple low side detection circuits indicate open, but the high side detection circuit indicates high voltage.	Report malfunction when the number of failure events A failure event occurs when the number of failed solenoids connected to HSD1	≥ 3 ≥ 2		Not Test Failed This Key On HSD2 is commanded ON Components powered AND Battery Voltage $\geq 9V$ If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage $> 10V$ Engine Speed ≥ 20 rpm	75 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Actuator Supply2 (HSD2) Voltage Low	P2670	This test detects low voltage when high voltage is expected indicating a short to ground at the circuit.	Report malfunction when short to ground is detected for a number of events	≥ 3 times	Not Test Failed This Key On HSD2 is commanded ON	P2670	75 ms	Type A, 1 Trip
Actuator Supply 2 (HSD2) Voltage High	P2671	This test detects if the voltage measured at the HSD 2 detection circuit indicates high during initialization (when the circuit is off)	During initialization, report malfunction when the number of failure events	≥ 3 times	During initialization Battery Voltage	≥ 9	18.75 ms	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
TCC Pressure Control Solenoid Control Circuit Open	P2761	This test detects torque converter solenoid electrical open circuit malfunctions.	<p>Fault pending is set on a single occurrence of hardware ground or open fault.</p> <p>IF either hardware faults are present THEN initiate intrusive test by opening low side driver</p> <p>IF intrusive test indicates open for THEN report malfunction</p>	<p>A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.01 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p> <p>An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance ≥ 173 kohm and shall not be detected if the circuit impedance is ≤ 9.6 kohm. The interface shall detect an open circuit condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p>	<p>Not Test Failed This Key On</p> <p>Components powered AND Battery Voltage ≥ 9 V</p> <p>If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V</p> <p>Engine Speed ≥ 20 rpm</p> <p>High Side Driver 2 Enabled</p>	<p>P2669</p> <p>P2670</p> <p>P2671</p>	125 ms	Type B, 2 Trips
TCC Pressure Control Solenoid Control Circuit Performance	P2762	This test detects the performance of the solenoid by comparing desired current to actual duty cycle	<p>current) ≥ 0.5 amps</p> <p>FOR ≥ 40 counts</p> <p>For a sample size < 80 samples</p> <p>THEN report malfunction</p>	<p>≥ 0.5 amps</p> <p>≥ 40 counts</p> <p>< 80 samples</p>	<p>Not Test Failed This Key On</p> <p>No Fault Pending DTC for this drive cycle.</p> <p>Components powered AND Battery Voltage ≥ 9 V</p> <p>If Engine Cranking, then</p>	<p>P2669</p> <p>P2670</p> <p>P2671</p> <p>P2761</p> <p>P2762</p> <p>P2764</p> <p>P2761</p> <p>P2763</p>	1000 ms	Type B, 2 Trips

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
						Crank Time < 4 seconds AND Battery Voltage > 10 V Engine Speed >= 20 rpm High Side Driver 2 Enabled Shift Complete Lockup Apply Complete OR Lockup Release Complete		
TCC Pressure Control Solenoid Control Circuit High	P2763	This test detects solenoid electrical short to power circuit malfunctions.	Short to power fault present for	> = 3 counts	A power short condition shall be detected if the circuit attached to the Controller external connection has an impedance <= 1.16 ohm to a voltage source within the Normal Operating Voltage Range or the High Operating Voltage Range. The interface shall detect a power short condition when the driver is On. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software. Not Test Failed This Key On Components powered AND Battery Voltage >= 9 V If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V Engine Speed >= 20 rpm High Side Driver 2 Enabled	P2669 P2670 P2671 P2763	75 ms	Type B, 2 Trips

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
TCC Pressure Control Solenoid Control Circuit Low	P2764	This test detects solenoid electrical ground circuit malfunctions.		<p>A ground short condition shall be detected if the circuit attached to the Controller external connection has an impedance ≤ 0.01 ohm to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND. The interface shall detect a ground short condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p> <p>An open circuit condition shall be detected if the circuit attached to the Controller external connection has an impedance ≥ 173 kohm and shall not be detected if the circuit impedance is ≤ 9.6 kohm. The interface shall detect an open circuit condition when the driver is Off. There is 10 usec fault filter. The fault is checked for every 6.25 ms by application software.</p>			125 ms	Type A, 1 Trip
Miscellaneous								
4 Wheel Drive Low Switch Circuit Malfunction	P2771	This test detects abnormal conditions for the four-wheel drive indication switch input by comparing switch state range to calculated range.	<p>Case 1 (Stuck Off) This test fails when, for number of occurrences, ≥ 1</p> <p>the transfer case 4WD switch indicates High range and the calculated transfer case range is Low range for a time ≥ 0.5 second</p> <p>Case 2 (Stuck On) This test fails when, for number of</p>		<p>All Cases</p> <p>Not Test Failed This Key On</p> <p>Components powered AND Battery Voltage ≥ 9 V</p> <p>If Engine Cranking, then Crank Time < 4 seconds AND Battery Voltage > 10 V</p> <p>Engine Speed ≥ 20 rpm</p> <p>High Side Driver 2 Enabled</p>	<p>P2669 P2670 P2671</p> <p>≥ 3 counts</p> <p>≥ 2 counts</p>	0.5 second	Type B, 2 Trips

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					B) secured controller or emission critical Ignition Voltage B) Power Mode C) ignition off enable C) Power Mode C) battery voltage	>= 11 volts = Run = TRUE (Boolean) = accessory >11 volts		
GMLAN ECM Controller State of Health Failure	U0100	This test detects GMLANbus failures by detecting State of Health failures in GMLAN messages \$191, \$0BE, \$0C9,\$1A1, \$287, \$2C3, \$3B9, \$3D1,\$3E9, \$3F9, \$4C1, and \$4F1 from ECM.	TCM Rx message missed frame TCM Rx frame message missed frame	= TRUE (Boolean)	fail times are calculated based on Rx message enable calibration set to CeCANR_e_BusA_ECM TCM Rx frame calibration enabled Frame recovery stabilization delay all conditions A and (B or C) below must occur for stabilization time Bus Stabilization time A) Service mode \$04 active and end of trip processing active A) normal serial data communication enabled A) U0073 status not B) secured controller or emission critical then use ignition voltage B) secured controller or emission critical Ignition Voltage B) Power Mode C) ignition off enable C) Power Mode C) battery voltage U0100 fault status is not Not Test Failed This Key On	Tx controller (see Table 1 in supporting document) enumeration >= 0.4 seconds >= 5 seconds = FALSE (Boolean) = TRUE (Boolean) = fault active = CeCANR_e_OBDII_Dsbl (Boolean) >= 11 volts = Run = TRUE (Boolean) =accessory >11 volts = fault active U0073	>= 10 seconds	Type B, 2 Trips
Lost Communication with GMLAN ABS Control Module	U0121	This test detects CAN (GMLAN) bus failures by detecting State of Health (SOH) failures in the following GMLAN messages \$0C1, \$0C5, \$0D0, \$1E9, and \$2F9 from Antilock Brake System (ABS) Control Module.	TCM Rx message missed frame TCM Rx frame message missed frame	= TRUE (Boolean)	fail times are calculated based on Rx message enable calibration set to CeCANR_e_BusA_ABS TCM Rx frame calibration enabled Frame recovery stabilization delay all conditions A and (B or C) below must occur for stabilization time Bus Stabilization time A) Service mode \$04 active and end of trip processing active A) normal serial data communication enabled A) P0073 status not B) secured controller or emission critical then use ignition voltage B) secured controller or emission critical Ignition Voltage B) Power Mode C) ignition off enable C) Power Mode C) battery voltage	Tx controller (see Table 1 in supporting document) enumeration >= 0.4 seconds >= 5 seconds = FALSE (Boolean) = TRUE (Boolean) = fault active = CeCANR_e_OBDII_Dsbl (Boolean) >= 11 volts = Run = TRUE (Boolean) =accessory > 11 volts	>= 10 seconds	Special Type C, No MIL

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					U0121 fault status is not Not Test Failed This Key On	= fault active U0073		
Lost Communication With Body Control Module	U0140	This test detects CAN (GMLAN) bus failures by detecting State of Health (SOH) failures in the following GMLAN messages \$0F1, \$1E1, \$1F3, and \$3F1 from the Truck Body Computer (TBC) Control	TCM Rx message missed frame		fail times are calculated based on Rx message enable calibration set to CeCANR_e_BusA_BCM	Tx controller		Special Type C, No MIL
			TCM Rx frame message missed frame	= TRUE (Boolean)	TCM Rx frame calibration enabled	(see Table 1 in supporting document) enumeration	>= 10 seconds	
					Frame recovery stabilization delay all conditions A and (B or C) below must occur for stabilization time Bus Stabilization time A) Service mode \$04 active and end of trip processing active A) normal serial data communication enabled A) P0073 status not B) secured controller or emission critical then use ignition voltage B) secured controller or emission critical Ignition Voltage B) Power Mode C) ignition off enable C) Power Mode C) battery voltage U0140 fault status is not Not Test Failed This Key On	>= 0.4 seconds >= 5 seconds = FALSE (Boolean) = TRUE (Boolean) = fault active = CeCANR_e_OBDII_Dsbl (Boolean) >= 11 volts = Run = TRUE (Boolean) = accessory >11 volts = fault active U0073		
Brake Switch Circuit	P0571	This test counts how many vehicle acceleration events occur while the brake switch indicates "ON" or the number of vehicle deceleration events while the brake switch indicates "OFF"	Case1: The number of vehicle accelerations with the brake switch "on" Case 2: The number of vehicle decelerations with the brake switch "off"	>= 10 >= 10	All Cases NOT Test Failed This Key On No Fault Pending DTCs Not Fault Active Components powered AND Battery Voltage Engine Speed between for	P0571 P0716 P0717 P07BF P07C0 P0721 P0722 P077C P077D P0703 >= 9 V 200 RPM and 7500 RPM	10 Acceleration Events 10 Deceleration Events	Special Type C, No MIL
Brake Pedal Position Switch Signal Rolling Count	P0703	This test detects rolling count failures for the Brake Switch GMLAN Message	The failure count increments when the GMLAN message is not received or the rolling counter does not agree with the		Components powered AND Battery Voltage between		15 seconds	Special Type C, No MIL

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			expected value		Engine Speed between	200 RPM and 7500 RPM		
			When the failure counter is > 5 for a time of > 10 seconds Report Failure		for 5 seconds			
Upshift Switch Circuit	P0815	This test detects the upshift switch ON	When PRNDL state is N, P or R and has been unchanged for a time >= 2.5 seconds AND upshift switch state is ON for a time >= 3 seconds. AND When PRNDL state is a forward range and has been unchanged for a time >= 2.5 seconds AND upshift switch state is ON for a time >= 600 seconds.		Not Test Failed This Key On Components powered AND Battery Voltage >= 9 V Engine Speed between 200 RPM and 7500 RPM for 5 seconds	P0826 P0708	603 seconds	Special Type C, No MIL
Downshift Switch Circuit	P0816	This test detects the downshift switch ON.	When PRNDL state is N, P or R and has been unchanged for a time >= 2.5 seconds AND downshift switch state is ON for a time. >= 3 seconds. AND When PRNDL state is a forward range and has been unchanged for a time >= 2.5 seconds AND downshift switch state is ON for a time >= 600 seconds.		Not Test Failed This Key On Components powered AND Battery Voltage >= 9 V Engine Speed between 200 RPM and 7500 RPM for 5 seconds	P0826 P0708	603 Seconds	Special Type C, No MIL
Up and Down Shift Switch Circuit	P0826	This test detects upshift/downshift switch circuit at an illegal state.	Switch state is ILLEGAL for a time >= 10 seconds.		Not Test Failed This Key On Components powered AND Battery Voltage >= 9 V Engine Speed between 200 RPM and 7500 RPM for 5 seconds	P0826	10 seconds	Special Type C, No MIL
Controller Memory								
Control Module Read Only Memory (ROM)	P0601	This test performs a check for ECC fault at controller initialization and a checksum test of all areas of ROM code using a CRC16 table driven method in background.	Incorrect program/calibrations checksum	= TRUE (Boolean)	Not Test Failed This Key On	P0601	= 1 Fail Counts first pass after reset (background task continuous) => 5 Fail Counts after first pass (background task continuous)	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			Errors in the software and calibration segments in the flash, detected by the micro's hardware based fault detection	= TRUE Boolean			>= 254 counts (Controller Initialization)	
Control Module Long Term Memory Reset	P0603	This function tests for error flags from the NVDP and logs a code if an error was detected.	fault condition exists that affects the validity of the copy of battery independent non-volatile data kept in RAM. latest copy of the battery independent non-volatile data may have been lost.	= TRUE (Boolean) = TRUE (Boolean)	Not Test Failed This Key On NVI_TestDiagEnbl	P0603	every controller initialization >= 3 counts (controller initialization)	Type A, 1 Trip
Control Module Random Access Memory (RAM)	P0604	RAM diagnostic	Test fails for any of following. secondary micro processor RAM error OR dual store RAM write time out error OR errors in the system RAM segment detected by the micro's hardware based fault detection OR parity errors in cache memory detected by the micro's hardware based fault detection OR signature faults detected in the TPU microcode by the micro's hardware based fault detection OR write attempt occurred during RAM lock	= TRUE (Boolean) = TRUE (Boolean) = TRUE (Boolean) = TRUE (Boolean) = TRUE (Boolean) = TRUE (Boolean)	Not Test Failed This Key On Service mode \$04 active or end of trip processing active	P0604	1000 ms cont. > 175 ms ((interrupt driven based on calling functions) >= 254 counts (controller initialization) >= 3 counts (controller initialization) >= 5 counts (controller initialization) > 655534 counts (background task continuous)	Type A, 1 Trip
Control Module Internal Performance	P0606	Processor integrity test.	main processor RAM error detection circuit hardware failure OR main processor flash EPROM error detection circuit hardware failure	= TRUE (Boolean) = TRUE (Boolean)	Not Test Failed This Key On RAM diagnostic test enable hardware reset source is controller power up reset flash EPROM diagnostic test enable	P0606	>= 5 counts (controller initialization) >= 5 counts (controller initialization)	Type A, 1 Trip

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			OR main processor memory stack failure	= TRUE (Boolean)	hardware reset source is controller power up reset diagnostic system enabled (diagnostic code clear not in progress AND all of the diag loops have completed their re-enable paths).	= TRUE (Boolean) = TRUE (Boolean)	>= 5 counts (100 msec continuous)	
			OR secondary processor memory stack failure	= TRUE (Boolean)	main processor memory stack test enable Post code clear diagnostic disabled	= 1 (Boolean) = FALSE (Boolean)	two consecutive counts continuously upon receipt from secondary (every 12.5 ms)	
			OR main processor ROM first test complete	= FALSE (Boolean)			>= 35 counts (controller power up 12.5 msec continuous)	
			OR no new seed from secondary processor to main processor seed	= TRUE (Boolean)	main processor to secondary processor serial peripheral interface error (main or 2dry detected)	= FALSE (Boolean)	for more than 0.45 seconds	
			OR seed sequence error	≠ FALSE (Boolean)	battery voltage > 11 Volts ignition voltage >= 8 Volts main processor to secondary processor serial peripheral interface error (main or 2dry detected)	= FALSE (Boolean)	3 counts out of 17 (on the 12.5 msec loop)	
			OR seed key fault received from 2dry	= TRUE (Boolean)	battery voltage > 11 Volts ignition voltage >= 8 Volts Post code clear diagnostic disabled	= FALSE (Boolean)	two consecutive counts (on the 12.5 ms loop)	
			OR normalize 0-5 volt (absolute value (analog to digital test voltage commanded - actual analog to digital voltage feedback))	> 9 percent	diagnostic system enabled (diagnostic code clear not in progress AND all of the diag loops have completed their re-enable paths) analog to digital voltage test enabled ignition voltage >= 7 Volts analog to digital voltage channel enabled analog to digital test voltage command	= TRUE (Boolean) = TRUE (Boolean) TRUE (Boolean) 5 Volts	5 out of 10 counts OR continuous for 0.15 sec (50 ms)	
			OR arithmetic logic unit test pass	= FALSE (Boolean)	arithmetic logic unit test enable	= 1 (Boolean)	two consecutive counts at controller initialization, then two consecutive counts continuously every 12.5 ms	
					diagnostic system enabled (diagnostic code clear not in progress AND all the diag loops have completed their re-enable paths) A and B and C must occur A: starter motor engaged	= TRUE (Boolean) = TRUE (Boolean)		

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			OR secondary processor arithmetic logic unit fault	= TRUE (Boolean)	B: ignition voltage > 11 Volts C: starter motor engaged time > 15 sec Post code clear diagnostic disabled	= FALSE (Boolean)	two consecutive counts continuously upon receipt from secondary (every 12.5 ms)	
			OR clock test fail	= TRUE (Boolean)	clock test enable	= 1 (Boolean)	two consecutive counts at controller initialization, then two consecutive counts continuously every 12.5 ms	
			OR configuration register test fail	= TRUE (Boolean)	diagnostic system enabled (diagnostic code clear not in progress AND all the diag loops have completed their re-enable paths) A and B and C must occur A: starter motor engaged B: ignition voltage > 11 Volts C: starter motor engaged time > 15 sec configuration register test enable	= TRUE (Boolean)	two consecutive counts at controller initialization, then two consecutive counts continuously every 12.5 ms	
			OR secondary processor configuration register fault	= TRUE (Boolean)	diagnostic system enabled (diagnostic code clear not in progress AND all the diag loops have completed their re-enable paths) A and B and C must occur A: starter motor engaged B: ignition voltage > 11 Volts C: starter motor engaged time > 15 sec Post code clear diagnostic disabled	= TRUE (Boolean)	two consecutive counts continuously upon receipt from secondary (every 12.5 ms)	
			OR main SOH discrete fault	= TRUE (Boolean)	Post code clear diagnostic disabled	= FALSE (Boolean)	two consecutive counts continuously upon receipt from secondary (every 12.5 ms)	
			OR SPI bus fault(i)	= TRUE (Boolean)	diagnostic system enabled (diagnostic code clear not in progress AND all the diag loops have completed their re-enable paths) A and B must occur A: run/crank voltage in range OR battery voltage in range B: Startup/Restart time	= TRUE (Boolean)	8 counts out of 16 (on the 6.25 msec loop)	
					A: run/crank voltage in range >= 11 Volts OR battery voltage in range > 11 Volts B: Startup/Restart time >= 0.125 sec			

17 OBDG04 TCM Summary Tables (Allison MW7)

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Control Module Long Term Memory Performance	P062F	Tests non volatile memory long term performance.	TCM Non-Volatile Memory read or write error (every controller initialization)	= TRUE (Boolean)	NVM write error diagnostic enable	TRUE	every controller initialization	Type A, 1 Trip
			assembly calibration integrity (every controller initialization)	= TRUE (Boolean)				
Control Module Serial Peripheral Interface Bus 2	P16E9	Serial peripheral hardware fault detected by secondary processor.	secondary micro processor hardware serial peripheral device fault active	= TRUE (Boolean)	Service mode \$04 active and end of trip processing active	= FALSE(Boolean)		Type A, 1 Trip
			secondary micro processor hardware serial peripheral device fault active previous loop	= TRUE (Boolean)				
Control Module Serial Peripheral Interface Bus 1	P16F0	Secondary processor message error detected by main processor.	secondary micro processor serial peripheral device message valid detected by primary micro processor since controller initialization OR secondary micro processor serial peripheral device message valid detected by primary micro processor after controller initializator OR secondary micro processor serial peripheral device message valid detected by primary micro processor after controller initializator	= FALSE (Boolean) = FALSE (Boolean) = FALSE(Boolean)			fail count >= 39 counts (12.5 ms) cont out of sample count >= 399 counts (12.5 ms) cont fail count >= 39 counts (12.5 ms) cont out of sample count >= 399 counts (12.5 ms) cont fail count >= 159 counts (12.5 ms) NON continuous out of sample count >= 399 counts (12.5 ms) NON continuous	Type A, 1 Trip
					NOT in low voltage engine crank condition defined by A or B below during, for low voltage mode time low voltage mode time >= 0.025 seconds A) low voltage mode hysteresis time <= 0.1 seconds B) ignition voltage, set low voltage mode <= 6.4092 volts			

17 OBDG04 TCM Diagnostic Summary Table - Allison MW7

Table 1

KaCANG_RxDeviceIdx
KaCANG_RxDeviceIdx

Axis	CeCANG_e_RcvMsg_0BE_BusA	CeCANG_e_RcvMsg_0C1_BusA	CeCANG_e_RcvMsg_0C5_BusA	CeCANG_e_RcvMsg_0C9_BusA	CeCANG_e_RcvMsg_0D0_BusA	frame
Curve	CeCANR_e_BusA_ECM	CeCANR_e_BusA_ABS	CeCANR_e_BusA_ABS	CeCANR_e_BusA_ECM	CeCANR_e_BusA_ABS	enable or invalid
Axis	CeCANG_e_RcvMsg_0F1_BusA	CeCANG_e_RcvMsg_191_BusA	CeCANG_e_RcvMsg_1A1_BusA	CeCANG_e_RcvMsg_1CF_BusA	CeCANG_e_RcvMsg_1E1_BusA	frame
Curve	CeCANR_e_BusA_BCM	CeCANR_e_BusA_ECM	CeCANR_e_BusA_ECM	CeCANR_e_InvalidRxDevice	CeCANR_e_BusA_BCM	enable or invalid
	CeCANG_e_RcvMsg_1E9_BusA	CeCANG_e_RcvMsg_1F3_BusA	CeCANG_e_RcvMsg_1F9_BusA	CeCANG_e_RcvMsg_1FC_BusA	CeCANG_e_RcvMsg_287_BusA	frame
	CeCANR_e_BusA_ABS	CeCANR_e_BusA_BCM	CeCANR_e_BusA_PTO	CeCANR_e_InvalidRxDevice	CeCANR_e_BusA_ECM	enable or invalid
	CeCANG_e_RcvMsg_2C3_BusA	CeCANG_e_RcvMsg_2D1_BusA	CeCANG_e_RcvMsg_2F9_BusA	CeCANG_e_RcvMsg_3B9_BusA	CeCANG_e_RcvMsg_3D1_BusA	frame
	CeCANR_e_BusA_ECM	CeCANR_e_InvalidRxDevice	CeCANR_e_BusA_ABS	CeCANR_e_BusA_ECM	CeCANR_e_BusA_ECM	enable or invalid
	CeCANG_e_RcvMsg_3E9_BusA	CeCANG_e_RcvMsg_3F1_BusA	CeCANG_e_RcvMsg_3F9_BusA	CeCANG_e_RcvMsg_4C1_BusA	CeCANG_e_RcvMsg_4F1_BusA	frame
	CeCANR_e_BusA_ECM	CeCANR_e_BusA_BCM	CeCANR_e_BusA_ECM	CeCANR_e_BusA_ECM	CeCANR_e_BusA_ECM	enable or invalid

17 OBDG04

Initial Supporting table - 1st FWD Thrshld

Description: Max Vehcile Velocity Allowed For 1st Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	60	60	60	60	60	60	60	79	85	88	100	100	100	100	100	105	120

17 OBDG04

Initial Supporting table -1st REV Thrshld

Description: Max Vehcile Velocity Allowed For 1st Gear - Reverse Velocity (if using directional speed sensor)

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	-12	-12	-12	-53	-59	-65	-72	-79	-85	-88	-100	-100	-100	-100	-100	-105	-120

17 OBDG04

Initial Supporting table - 2nd FWD Thrshld

Description: Max Vehcile Velocity Allowed For 2nd Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	70	72	72	73	79	85	93	99	105	108	110	113	123	147	169	172	200

17 OBDG04

Initial Supporting table - 2nd REV Thrshld

Description: Max Vehcile Velocity Allowed For 2nd Gear - Reverse Velocity (if using directional speed sensor)

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	-85	-86	-88	-89	-90	-98	-105	-115	-125	-135	-148	-160	-181	-201	-221	-240	-250

17 OBDG04

Initial Supporting table - 3rd FWD Thrshld

Description: Max Vehcile Velocity Allowed For 3rd Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	105	106	107	108	110	114	120	127	145	150	160	170	180	200	240	280	300

17 OBDG04

Initial Supporting table - 4th FWD Thrshld

Description: Max Vehcile Velocity Allowed For 4th Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	105	106	107	108	110	114	120	127	145	150	160	170	180	200	240	280	300

17 OBDG04

Initial Supporting table - 5th FWD Thrshld

Description: Max Vehcile Velocity Allowed For 5th Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	135	136	137	138	140	142	150	157	165	193	300	300	300	300	300	300	300

17 OBDG04

Initial Supporting table - 6th FWD Thrshld

Description: Max Vehcile Velocity Allowed For 6th Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300

17 OBDG04

Initial Supporting table - 7th FWD Thrshld

Description: Max Vehcile Velocity Allowed For 7th Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300

17 OBDG04

Initial Supporting table - 8th FWD Thrshld

Description: Max Vehcile Velocity Allowed For 8th Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300

17 OBDG04

Initial Supporting table - 9th FWD Thrshld

Description: Max Vehcile Velocity Allowed For 9th Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300

17 OBDG04

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	0.100

17 OBDG04

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	0.100

17 OBDG04

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	0.100

17 OBDG04

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	0.100

17 OBDG04

Initial Supporting table - P0606_Last Seed Timeout f(Loop Time)

Description: The max time for the Last Seed Timeout as a function of operating loop time sequence.

Value Units: Max Time for Last Seed Timeout (ms)

X Unit: Operating Loop Sequence (enum)

P0606_Last Seed Timeout f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_10msSeq	CePISR_e_12p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	200.000	200.000	200.000	200.000	200.000	200.000	200.000

P0606_Last Seed Timeout f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_100msSeq	CePISR_e_EventA_Seq	CePISR_e_EventB_Seq	CePISR_e_EventC_Seq	
1	200.000	200.000	200.000	8,191.875	8,191.875	8,191.875	

17 OBDG04

Initial Supporting table - P0606_Program Sequence Watch Enable f(Core, Loop Time)

Description: The enabling flags for the program sequence watch as a function of processor core and operating loop time sequence.

Value Units: PSW enable flag (boolean)

X Unit: Processor Core (enum)

Y Units: Operating Loop Time Sequence (enum)

y/x	CeTSKR_e_CPU	CeTSKR_e_CPU2	CeTSKR_e_CPU3	CeTSKR_e_CPU4
CePISR_e_5msSeq	0	0	0	0
CePISR_e_6p25msSeq	1	0	0	0
CePISR_e_10msSeq	0	0	0	0
CePISR_e_12p5msSeq	1	0	0	0
CePISR_e_20msSeq	0	0	0	0
CePISR_e_25msSeq	1	0	0	0
CePISR_e_40msSeq	0	0	0	0
CePISR_e_50msSeq	0	0	0	0
CePISR_e_80msSeq	0	0	0	0
CePISR_e_100msSeq	0	0	0	0
CePISR_e_EventA_Seq	0	0	0	0
CePISR_e_EventB_Seq	0	0	0	0
CePISR_e_EventC_Seq	0	0	0	0

Initial Supporting table - P0606_PSW Sequence Fail f(Loop Time)

Description: Fail threshold for PSW per operating loop.

Value Units: Fail threshold for PSW (count)

X Unit: Operating Loop (enum)

P0606_PSW Sequence Fail f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_10msSeq	CePISR_e_12p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	3	3	3	3	3	3	3

P0606_PSW Sequence Fail f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_100msSeq	CePISR_e_EventA_Seq	CePISR_e_EventB_Seq	CePISR_e_EventC_Seq	
1	3	3	3	3	3	3	

Initial Supporting table - P0606_PSW Sequence Sample f(Loop Time)

Description: Sample threshold for PSW per operating loop.

Value Units: Sample threshold for PSW (count)

X Unit: Operating Loop (enum)

P0606_PSW Sequence Sample f(Loop Time) - Part 1

y/x	CePISR_e_5msSeq	CePISR_e_6p25msSeq	CePISR_e_10msSeq	CePISR_e_12p5msSeq	CePISR_e_20msSeq	CePISR_e_25msSeq	CePISR_e_40msSeq
1	4	4	4	4	4	4	4

P0606_PSW Sequence Sample f(Loop Time) - Part 2

y/x	CePISR_e_50msSeq	CePISR_e_80msSeq	CePISR_e_100msSeq	CePISR_e_EventA_Seq	CePISR_e_EventB_Seq	CePISR_e_EventC_Seq	
1	4	4	4	4	4	4	

17 OBDG04

Initial Supporting table - P0723 transmission engaged state time threshold

Description: time necessary after transmission engaged state indicates transmsision engaged to allow P0723 enable

Value Units: seconds

X Unit: °C

y/x	-40.000	0.000	40.000
1	5.000	5.000	5.000

17 OBDG04

Initial Supporting table - P0741 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	0.350	0.350	0.350

17 OBDG04

Initial Supporting table - P0741 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

17 OBDG04

Initial Supporting table - P0741 torque convert derivative slip speed fail threshold

Description: The fail threshold, rate of change of torque converter slip speed, at which the torque convert clutch is considered stuck on.

Value Units: RPM/second

X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	500.0	500.0	500.0

17 OBDG04

Initial Supporting table - P0747 C1 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P0747 C1 clutch exhaust delay time 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	1.600	1.100	0.950	0.850	0.850

17 OBDG04

Initial Supporting table - P0747 C1 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P0747 C1 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P0747 C1 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P0747 C1 clutch exhaust delay time 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	1.600	1.100	0.950	0.269	0.269

17 OBDG04

Initial Supporting table - P0777 C2 clutch exhaust delay time 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	0.200	0.200

17 OBDG04

Initial Supporting table - P0777 C2 clutch exhaust delay time closed throttle lift foot up shift

Description: P0777 C2 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

17 OBDG04

Initial Supporting table - P0777 C2 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P0777 C2 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P0777 C2 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P0777 C2 clutch exhaust delay time 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	1.600	1.100	0.950	0.262	0.262

17 OBDG04

Initial Supporting table - P0797 C3 clutch exhaust delay time 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	1.600	1.100	0.950	0.200	0.200

17 OBDG04

Initial Supporting table - P0797 C3 clutch exhaust delay time 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	1.600	1.100	0.950	0.850	0.850

17 OBDG04

Initial Supporting table - P0797 C3 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P0797 C3 clutch exhaust delay time 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	0.144	0.144

17 OBDG04

Initial Supporting table - P0797 C3 clutch exhaust delay time 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	1.600	1.100	0.950	0.256	0.256

17 OBDG04

Initial Supporting table - P0797 C3clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P176B delay to allow transmission input, intermediate and output speeds to stabilize for fail evaluation

Description: delay to allow transmission input, intermediate and output speeds to stabilize 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

17 OBDG04

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: commanded gear

Y Units: intermediate speed sensor select

P176B holding clutch states - Part 1

y/x	CeCGSR_e_CR_NullF orSched	CeCGSR_e_CR_Neut ral	CeCGSR_e_CR_Park	CeCGSR_e_CR_Reve rse	CeCGSR_e_CR_First	CeCGSR_e_CR_Seco nd	CeCGSR_e_CR_Third
CeTSRR_e_C2C_Clc hSpdSnsr1	1	1	1	0	0	0	1
CeTSRR_e_C2C_Clc hSpdSnsr2	1	1	1	1	1	1	1

P176B holding clutch states - Part 2

y/x	CeCGSR_e_CR_Fourt h	CeCGSR_e_CR_Fifth	CeCGSR_e_CR_Sixth	CeCGSR_e_CR_Seve nth	CeCGSR_e_CR_Eight h	CeCGSR_e_CR_Ninth	CeCGSR_e_CR_Tent h
CeTSRR_e_C2C_Clc hSpdSnsr1	0	0	0	0	1	0	1
CeTSRR_e_C2C_Clc hSpdSnsr2	1	1	1	1	1	1	1

17 OBDG04

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

17 OBDG04

Initial Supporting table - P176B intermediate speed sensor fail RPM threshold

Description: P176B intermediate speed sensor fail RPM speed threshold

Value Units: RPM

X Unit: intermediate speed sensor select

y/x	CeTSRR_e_C2C_ClchSpdSnsr1	CeTSRR_e_C2C_ClchSpdSnsr2
1	20.0	20.0

17 OBDG04

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

17 OBDG04

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	160.0	160.0

17 OBDG04

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	160.0	160.0

17 OBDG04

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_C2 C_ClchSpdSnsr 1	1.5848	6.3694	1.0000	2.4450	1.0000	0.5227	1.0000	1.0000	1.1905	1.0000
CeTSRR_e_C2 C_ClchSpdSnsr 2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

17 OBDG04

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

17 OBDG04

Initial Supporting table - P2715 C4 clutch exhaust delay time 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	1.600	1.100	0.950	0.225	0.225

17 OBDG04

Initial Supporting table - P2715 C4 clutch exhaust delay time 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	1.600	1.100	0.950	0.850	0.850

17 OBDG04

Initial Supporting table - P2715 C4 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P2715 C4 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P2715 C4 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P2715 C4 clutch exhaust delay time 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	1.600	1.100	0.950	0.300	0.300

17 OBDG04

Initial Supporting table - P2724 C5 clutch exhaust delay time 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	1.600	1.100	0.950	0.337	0.337

17 OBDG04

Initial Supporting table - P2724 C5 clutch exhaust delay time 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	1.600	1.100	0.950	0.850	0.850

17 OBDG04

Initial Supporting table - P2724 C5 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P2724 C5 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P2724 C5 clutch exhaust delay time 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	1.600	1.100	0.950	0.163	0.163

17 OBDG04

Initial Supporting table - P2724 C5 clutch exhaust delay time 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	1.600	1.100	0.950	0.406	0.406

17 OBDG04

Initial Supporting table - P2733 C6 clutch exhaust delay time closed throttle down shift

Description: P2733 C6 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	0.350	0.350

17 OBDG04

Initial Supporting table - P2733 C6 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P2733 C6 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P2733 C6 clutch exhaust delay time 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

17 OBDG04

Initial Supporting table - P2733 C6 clutch exhaust delay time 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	1.600	1.100	0.950	0.131	0.131

17 OBDG04

Initial Supporting table - P2733 C6 clutch exhaust delay time 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	0.600	0.600

17 OBDG04

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

17 OBDG04

Initial Supporting table - P2818 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	0.350	0.350	0.350

17 OBDG04

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

17 OBDG04

Initial Supporting table - P2818 torque convert derivative slip speed fail threshold

Description: The fail threshold, rate of change of torque converter slip speed, at which the torque convert clutch is considered stuck on.

Value Units: RPM/second

X Unit: transmission fluid temperature °C

y/x	-7.00	10.00	40.00
1	-2,000.0	-2,000.0	-2,000.0

17 OBDG04

Initial Supporting table - P2D2 Clutch Slip Sum

Description:

X Unit: Brake Pedal %

Y Units: dn rpm

y/x	0	13	25	38	50	63	75	88	100
1	-1	-6	-12	-17	-23	-28	-33	-39	-44

Initial Supporting table - P2D2 Decel Pressure - C1

Description:

Value Units: Kpa
 X Unit: Cmnd Gear
 Y Units: Kpa

P2D2 Decel Pressure - C1 - Part 1

y/x	CeCGSR_e_NullForScheduled	CeCGSR_e_Neutral	CeCGSR_e_NeutralNoClutch	CeCGSR_e_NeutralC1	CeCGSR_e_NeutralC2	CeCGSR_e_NeutralC3	CeCGSR_e_NeutralC4
1	186	186	186	186	186	186	186

P2D2 Decel Pressure - C1 - Part 2

y/x	CeCGSR_e_NeutralC5	CeCGSR_e_NeutralC6	CeCGSR_e_NeutralC7	CeCGSR_e_NeutralC1C2	CeCGSR_e_NeutralC2C3	CeCGSR_e_NeutralC2C4	CeCGSR_e_NeutralC2C5
1	186	186	186	186	186	186	186

P2D2 Decel Pressure - C1 - Part 3

y/x	CeCGSR_e_NeutralC2C6	CeCGSR_e_NeutralC3C4	CeCGSR_e_NeutralC3C5	CeCGSR_e_NeutralC3C6	CeCGSR_e_NeutralC4C5	CeCGSR_e_NeutralC4C6	CeCGSR_e_Park
1	186	186	186	186	186	186	186

P2D2 Decel Pressure - C1 - Part 4

y/x	CeCGSR_e_Reverse	CeCGSR_e_FirstLckd	CeCGSR_e_FirstFW	CeCGSR_e_SecondLckd	CeCGSR_e_SecondFW	CeCGSR_e_Third	CeCGSR_e_Fourth
1	186	99,999	99,999	186	186	186	186

P2D2 Decel Pressure - C1 - Part 5

y/x	CeCGSR_e_Fifth	CeCGSR_e_Sixth	CeCGSR_e_Seventh	CeCGSR_e_Eighth	CeCGSR_e_Ninth	CeCGSR_e_Tenth	
1	186	99,999	99,999	99,999	99,999	186	

Initial Supporting table - P2D2 Decel Pressure - C2

Description:

Value Units: Kpa
 X Unit: Cmnd Gear
 Y Units: Kpa

P2D2 Decel Pressure - C2 - Part 1

y/x	CeCGSR_e_NullForScheduled	CeCGSR_e_Neutral	CeCGSR_e_NeutralNoClutch	CeCGSR_e_NeutralC1	CeCGSR_e_NeutralC2	CeCGSR_e_NeutralC3	CeCGSR_e_NeutralC4
1	358	358	358	358	358	358	358

P2D2 Decel Pressure - C2 - Part 2

y/x	CeCGSR_e_NeutralC5	CeCGSR_e_NeutralC6	CeCGSR_e_NeutralC7	CeCGSR_e_NeutralC1C2	CeCGSR_e_NeutralC2C3	CeCGSR_e_NeutralC2C4	CeCGSR_e_NeutralC2C5
1	358	358	358	358	358	358	358

P2D2 Decel Pressure - C2 - Part 3

y/x	CeCGSR_e_NeutralC2C6	CeCGSR_e_NeutralC3C4	CeCGSR_e_NeutralC3C5	CeCGSR_e_NeutralC3C6	CeCGSR_e_NeutralC4C5	CeCGSR_e_NeutralC4C6	CeCGSR_e_Park
1	358	358	358	358	358	358	358

P2D2 Decel Pressure - C2 - Part 4

y/x	CeCGSR_e_Reverse	CeCGSR_e_FirstLckd	CeCGSR_e_FirstFW	CeCGSR_e_SecondLckd	CeCGSR_e_SecondFW	CeCGSR_e_Third	CeCGSR_e_Fourth
1	358	358	358	99,999	99,999	358	358

P2D2 Decel Pressure - C2 - Part 5

y/x	CeCGSR_e_Fifth	CeCGSR_e_Sixth	CeCGSR_e_Seventh	CeCGSR_e_Eighth	CeCGSR_e_Ninth	CeCGSR_e_Tenth	
1	358	99,999	358	358	358	99,999	

Initial Supporting table - P2D2 Decel Pressure - C3

Description:

Value Units: Kpa
 X Unit: Cmnd Gear
 Y Units: Kpa

P2D2 Decel Pressure - C3 - Part 1

y/x	CeCGSR_e_NullForScheduled	CeCGSR_e_Neutral	CeCGSR_e_NeutralNoClutch	CeCGSR_e_NeutralC1	CeCGSR_e_NeutralC2	CeCGSR_e_NeutralC3	CeCGSR_e_NeutralC4
1	443	443	443	443	443	443	443

P2D2 Decel Pressure - C3 - Part 2

y/x	CeCGSR_e_NeutralC5	CeCGSR_e_NeutralC6	CeCGSR_e_NeutralC7	CeCGSR_e_NeutralC1C2	CeCGSR_e_NeutralC2C3	CeCGSR_e_NeutralC2C4	CeCGSR_e_NeutralC2C5
1	443	443	443	443	443	443	443

P2D2 Decel Pressure - C3 - Part 3

y/x	CeCGSR_e_NeutralC2C6	CeCGSR_e_NeutralC3C4	CeCGSR_e_NeutralC3C5	CeCGSR_e_NeutralC3C6	CeCGSR_e_NeutralC4C5	CeCGSR_e_NeutralC4C6	CeCGSR_e_Park
1	443	443	443	443	443	443	443

P2D2 Decel Pressure - C3 - Part 4

y/x	CeCGSR_e_Reverse	CeCGSR_e_FirstLckd	CeCGSR_e_FirstFW	CeCGSR_e_SecondLckd	CeCGSR_e_SecondFW	CeCGSR_e_Third	CeCGSR_e_Fourth
1	443	443	443	443	443	99,999	443

P2D2 Decel Pressure - C3 - Part 5

y/x	CeCGSR_e_Fifth	CeCGSR_e_Sixth	CeCGSR_e_Seventh	CeCGSR_e_Eighth	CeCGSR_e_Ninth	CeCGSR_e_Tenth	
1	443	443	99,999	443	443	99,999	

Initial Supporting table - P2D2 Decel Pressure - C4

Description:

Value Units: Kpa
 X Unit: Cmnd Gear
 Y Units: Kpa

P2D2 Decel Pressure - C4 - Part 1

y/x	CeCGSR_e_NullForScheduled	CeCGSR_e_Neutral	CeCGSR_e_NeutralNoClutch	CeCGSR_e_NeutralC1	CeCGSR_e_NeutralC2	CeCGSR_e_NeutralC3	CeCGSR_e_NeutralC4
1	373	373	373	373	373	373	373

P2D2 Decel Pressure - C4 - Part 2

y/x	CeCGSR_e_NeutralC5	CeCGSR_e_NeutralC6	CeCGSR_e_NeutralC7	CeCGSR_e_NeutralC1C2	CeCGSR_e_NeutralC2C3	CeCGSR_e_NeutralC2C4	CeCGSR_e_NeutralC2C5
1	373	373	373	373	373	373	373

P2D2 Decel Pressure - C4 - Part 3

y/x	CeCGSR_e_NeutralC2C6	CeCGSR_e_NeutralC3C4	CeCGSR_e_NeutralC3C5	CeCGSR_e_NeutralC3C6	CeCGSR_e_NeutralC4C5	CeCGSR_e_NeutralC4C6	CeCGSR_e_Park
1	373	373	373	373	373	373	373

P2D2 Decel Pressure - C4 - Part 4

y/x	CeCGSR_e_Reverse	CeCGSR_e_FirstLckd	CeCGSR_e_FirstFW	CeCGSR_e_SecondLckd	CeCGSR_e_SecondFW	CeCGSR_e_Third	CeCGSR_e_Fourth
1	373	373	373	373	373	373	99,999

P2D2 Decel Pressure - C4 - Part 5

y/x	CeCGSR_e_Fifth	CeCGSR_e_Sixth	CeCGSR_e_Seventh	CeCGSR_e_Eighth	CeCGSR_e_Ninth	CeCGSR_e_Tenth	
1	373	373	373	99,999	373	373	

Initial Supporting table - P2D2 Decel Pressure - C5

Description:

Value Units: Kpa
 X Unit: Cmnd Gear
 Y Units: Kpa

P2D2 Decel Pressure - C5 - Part 1

y/x	CeCGSR_e_NullForScheduled	CeCGSR_e_Neutral	CeCGSR_e_NeutralNoClutch	CeCGSR_e_NeutralC1	CeCGSR_e_NeutralC2	CeCGSR_e_NeutralC3	CeCGSR_e_NeutralC4
1	315	315	315	315	315	315	315

P2D2 Decel Pressure - C5 - Part 2

y/x	CeCGSR_e_NeutralC5	CeCGSR_e_NeutralC6	CeCGSR_e_NeutralC7	CeCGSR_e_NeutralC1C2	CeCGSR_e_NeutralC2C3	CeCGSR_e_NeutralC2C4	CeCGSR_e_NeutralC2C5
1	315	315	315	315	315	315	315

P2D2 Decel Pressure - C5 - Part 3

y/x	CeCGSR_e_NeutralC2C6	CeCGSR_e_NeutralC3C4	CeCGSR_e_NeutralC3C5	CeCGSR_e_NeutralC3C6	CeCGSR_e_NeutralC4C5	CeCGSR_e_NeutralC4C6	CeCGSR_e_Park
1	315	315	315	315	315	315	315

P2D2 Decel Pressure - C5 - Part 4

y/x	CeCGSR_e_Reverse	CeCGSR_e_FirstLckd	CeCGSR_e_FirstFW	CeCGSR_e_SecondLckd	CeCGSR_e_SecondFW	CeCGSR_e_Third	CeCGSR_e_Fourth
1	315	315	315	315	315	315	315

P2D2 Decel Pressure - C5 - Part 5

y/x	CeCGSR_e_Fifth	CeCGSR_e_Sixth	CeCGSR_e_Seventh	CeCGSR_e_Eighth	CeCGSR_e_Ninth	CeCGSR_e_Tenth	
1	99,999	315	315	315	99,999	315	

Initial Supporting table - P2D2 Decel Pressure - C6

Description:

Value Units: Kpa
 X Unit: Cmnd Gear
 Y Units: Kpa

P2D2 Decel Pressure - C6 - Part 1

y/x	CeCGSR_e_NullForScheduled	CeCGSR_e_Neutral	CeCGSR_e_NeutralNoClutch	CeCGSR_e_NeutralC1	CeCGSR_e_NeutralC2	CeCGSR_e_NeutralC3	CeCGSR_e_NeutralC4
1	315	315	315	315	315	315	315

P2D2 Decel Pressure - C6 - Part 2

y/x	CeCGSR_e_NeutralC5	CeCGSR_e_NeutralC6	CeCGSR_e_NeutralC7	CeCGSR_e_NeutralC1C2	CeCGSR_e_NeutralC2C3	CeCGSR_e_NeutralC2C4	CeCGSR_e_NeutralC2C5
1	315	315	315	315	315	315	315

P2D2 Decel Pressure - C6 - Part 3

y/x	CeCGSR_e_NeutralC2C6	CeCGSR_e_NeutralC3C4	CeCGSR_e_NeutralC3C5	CeCGSR_e_NeutralC3C6	CeCGSR_e_NeutralC4C5	CeCGSR_e_NeutralC4C6	CeCGSR_e_Park
1	315	315	315	315	315	315	315

P2D2 Decel Pressure - C6 - Part 4

y/x	CeCGSR_e_Reverse	CeCGSR_e_FirstLckd	CeCGSR_e_FirstFW	CeCGSR_e_SecondLckd	CeCGSR_e_SecondFW	CeCGSR_e_Third	CeCGSR_e_Fourth
1	315	315	315	315	315	315	315

P2D2 Decel Pressure - C6 - Part 5

y/x	CeCGSR_e_Fifth	CeCGSR_e_Sixth	CeCGSR_e_Seventh	CeCGSR_e_Eighth	CeCGSR_e_Ninth	CeCGSR_e_Tenth	
1	9,999	315	315	315	9,999	315	

Initial Supporting table - P2D2 Decel Pressure - C7

Description:

Value Units: Kpa
 X Unit: Cmnd Gear
 Y Units: Kpa

P2D2 Decel Pressure - C7 - Part 1

y/x	CeCGSR_e_NullForScheduled	CeCGSR_e_Neutral	CeCGSR_e_NeutralNoClutch	CeCGSR_e_NeutralC1	CeCGSR_e_NeutralC2	CeCGSR_e_NeutralC3	CeCGSR_e_NeutralC4
1	0	0	0	0	0	0	0

P2D2 Decel Pressure - C7 - Part 2

y/x	CeCGSR_e_NeutralC5	CeCGSR_e_NeutralC6	CeCGSR_e_NeutralC7	CeCGSR_e_NeutralC1C2	CeCGSR_e_NeutralC2C3	CeCGSR_e_NeutralC2C4	CeCGSR_e_NeutralC2C5
1	0	0	0	0	0	0	0

P2D2 Decel Pressure - C7 - Part 3

y/x	CeCGSR_e_NeutralC2C6	CeCGSR_e_NeutralC3C4	CeCGSR_e_NeutralC3C5	CeCGSR_e_NeutralC3C6	CeCGSR_e_NeutralC4C5	CeCGSR_e_NeutralC4C6	CeCGSR_e_Park
1	0	0	0	0	0	0	0

P2D2 Decel Pressure - C7 - Part 4

y/x	CeCGSR_e_Reverse	CeCGSR_e_FirstLckd	CeCGSR_e_FirstFW	CeCGSR_e_SecondLckd	CeCGSR_e_SecondFW	CeCGSR_e_Third	CeCGSR_e_Fourth
1	0	9,999	9,999	0	0	0	0

P2D2 Decel Pressure - C7 - Part 5

y/x	CeCGSR_e_Fifth	CeCGSR_e_Sixth	CeCGSR_e_Seventh	CeCGSR_e_Eighth	CeCGSR_e_Ninth	CeCGSR_e_Tenth	
1	0	0	0	0	0	0	

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Initial Supporting table - REV Thrshld (Forward Velocity)

Description: Max Vehcile Velocity Allowed For Reverse Gear - Forward Velocity

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15

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Initial Supporting table - REV Thrshld (Negative Velocity)

Description: Max Vehcile Velocity Allowed For Reverse Gear - Reverse Velocity (if using directional speed sensor)

Value Units: KPH

X Unit: % Pedal

Y Units: KPH

y/x	0	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100
1	-57	-57	-57	-57	-57	-57	-72	-79	-85	-88	-100	-100	-100	-100	-100	-105	-120

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Initial Supporting table - transmission fluid temperature warm up time

Description:

Value Units: transmission fluid temperature normal warm 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

17 OBDG04 Fault Bundle Definitions

Bundle Name: AcceleratorPedalFailure
P2122, P2123, P2127, P2128, P2138, P0697, P06A3
Bundle Name: CrankSensor_FA
P0335, P0336
Bundle Name: ECT_Sensor_FA
P0116, P0117, P0118, P0119, P0128, P111E
Bundle Name: EngineTorqueEstInaccurate
EngineMisfireDetected_FA, FuelInjectorCircuit_FA, FuelInjectorCircuit_TFTKO, FuelTrimSystemB1_FA, FuelTrimSystemB2_FA, MAF_SensorTFTKO, MAP_SensorTFTKO, EGRValvePerformance_FA, P16F3
EngineTorqueEstInaccurate - Other Definitions:
P16F3 with GetXOYR_b_SecurityFlt (CeXOYR_e_MAPR_AfterThrotPresFlt, CeXOYR_e_MAPR_EngineVacuumFlt, CeXOYR_e_MAPR_IntkMnfdPresFlt, CeXOYR_e_MAFR_Ahead1vs2FinalFlt)
Bundle Name: Transmission Shift Lever Position Validity
P1824, P182A, P182B, P182C, P182D, P182E, P182F, P1838, P1839, P1840, P1841, P18B5, P18B6, P18B7, P18B8, P18B9, P18BA, P18BB, P18BC, P18BD, P18BE, P18BF, P18C0, P18C1, P18C2, P18C3, P1915
Bundle Name: VehicleSpeedSensor_FA
P0502, P0503, P0722, P0723
Bundle Name: VehicleSpeedSensorError
P0502, P0503, P0722, P0723