

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Camshaft Actuator Solenoid Circuit Open – Bank 1	P0010	Diagnoses the VVT system high side driver circuit for circuit faults.	The ECM detects that voltage is high during driver off state (indicates short to power or open circuit)	Short to power: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between signal and controller ground	System supply voltage is within limits Output driver is commanded on, Ignition switch is in crank or run position	> 11 Volts	20 failures out of 25 samples 250 ms / sample, continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Camshaft System Performance – Bank 1	P0011	Detects a VVT system error by comparing the desired and actual cam positions when VVT is activated	Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive	(Intake cam Bank 1) Cam Position Error > 8.00 deg. (CamPosErrorLimlc1)	DTC's are NOT active: P0010, IntakeCamSensorTFTKO CrankSensorTFTKO CrankIntakeCamCorrelationFA.	System Voltage > 11 Volts, Engine is running VVT is enabled Desired cam position > 0 Power Take Off (PTO) not active Both Desired & Measured cam positions cannot be < 8.00 (CamPosErrorLimlc1) or have both > 18.00 deg. (PerfMaxlc1) . Desired cam position cannot vary more than 7.50 Cam Deg for at least 3.35 sec. (StablePositionTime1c1)	100.00 failures out of 1,000.00 samples 100 ms / sample	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position (CKP)- Camshaft Position (CMP) Correlation Bank 1 Sensor A	P0016	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 1 sensor A occurs during the incorrect crank position	2 cam sensor pulses more than -11.0 crank degrees before or 11.0 crank degrees after nominal position in one cam revolution.		Crankshaft and camshaft position signals are synchronized Engine is Spinning Cam phaser is in "parked" position No Active DTCs: Time since last execution of diagnostic	P0335, P0336 P0340,P0341 5VoltReferenceA_FA 5VoltReferenceB_FA < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. There is a delay after the first failed test to allow the camshaft position to return to the park position. This time is defined by the table "Cam Correlation Oil Temperature Threshold". One sample per cam rotation	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank 1 Sensor 1	P0030	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between signal and controller ground.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0031 may also set

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank1 Sensor1	P0031	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short- to-ground).	Short to ground: $\leq 0.5 \Omega$ impedance between signal and controller ground.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0030 may also set

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank1 Sensor1	P0032	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power).	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank 1 Sensor 2	P0036	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit).	Open Circuit: ≥ 200 K Ω impedance between signal and controller ground.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0037 may also set

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank1 Sensor2	P0037	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short- to-ground).	Short to ground: $\leq 0.5 \Omega$ impedance between signal and controller ground.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0036 may also set

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank1 Sensor2	P0038	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power).	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank 2 Sensor 1	P0050	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit).	Open Circuit: ≥ 200 K Ω impedance between signal and controller ground.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0051 may also set

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank2 Sensor1	P0051	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short- to-ground).	Short to ground: $\leq 0.5 \Omega$ impedance between signal and controller ground.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0050 may also set

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank2 Sensor1	P0052	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power).	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
HO2S Heater Resistance Bank 1 Sensor 1	P0053	Detects an oxygen sensor heater having an incorrect or out of range resistance value.	Heater Resistance outside of the expected range of	$2.8 < \Omega < 9.5$	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 °C > 28,800 seconds -30.0 < °C < 45.0 < 32.0 volts < 0.04 seconds	Once per valid cold start	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
HO2S Heater Resistance Bank 1 Sensor 2) (For Dual Bank Exhaust Only	P0054	Detects an oxygen sensor heater having an incorrect or out of range resistance value.	Heater Resistance outside of the expected range of	$2.8 < \Omega < 9.5$	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 °C > 28,800 seconds -30.0 < °C < 45.0 < 32.0 volts < 0.04 seconds	Once per valid cold start	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank 2 Sensor 2	P0056	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit).	Open Circuit: ≥ 200 K Ω impedance between signal and controller ground.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0057 may also set

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank2 Sensor2	P0057	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short- to-ground).	Short to ground: $\leq 0.5 \Omega$ impedance between signal and controller ground.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0056 may also set

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Control Circuit Bank2 Sensor2	P0058	Diagnoses the Heater Output low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power).	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power.	Ignition Voltage Engine Speed	= Crank or Run > 11.0 volts > 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
HO2S Heater Resistance Bank 2 Sensor 1	P0059	Detects an oxygen sensor heater having an incorrect or out of range resistance value.	Heater Resistance outside of the expected range of	$3.8 < \Omega < 10.4$	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 °C > 28,800 seconds -30.0 < °C < 45.0 < 32.0 volts < 0.09 seconds	Once per valid cold start	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
HO2S Heater Resistance Bank 2 Sensor 2	P0060	Detects an oxygen sensor heater having an incorrect or out of range resistance value.	Heater Resistance outside of the expected range of	$3.8 < \Omega < 10.4$	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 °C > 28,800 seconds -30.0 < °C < 45.0 < 32.0 volts < 0.09 seconds	Once per valid cold start	Type B, 2 Trips

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

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Radiator Coolant Temp Sensor Circuit Low Voltage	P00B3	This DTC detects a short to ground in the RCT signal circuit or the RCT sensor.	RCT Resistance (@ 150°C)	< 45 Ohms	Engine run time OR IAT min	> 0.0 seconds ≤ 150.0 °C	5 failures out of 25 samples 1 sec/ sample Continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Radiator Coolant Temp Sensor Circuit High Voltage	P00B4	Circuit Continuity This DTC detects a short to high or open in the RCT signal circuit or the RCT sensor.	RCT Resistance (@ -60°C)	> 419,000 Ohms	Engine run time OR IAT min	> 10.0 seconds ≥ -7.0 °C	5 failures out of 25 samples 1 sec/ sample Continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Radiator Coolant Temp - Engine Coolant Temp (ECT) Correlation (DCRD)	P00B6	This DTC detects a difference between ECT and RCT after a soak condition.	<p>A failure will be reported if any of the following occur:</p> <p>1) Absolute difference between ECT at power up & RCT at power up is \geq an IAT based threshold table lookup value(fast fail).</p> <p>2) Absolute difference between ECT at power up & RCT at power up is $>$ by 19.3°C and a block heater has not been detected.</p> <p>3) ECT at power up $>$ RCT at power up by 19.3°C and the time spent cranking the engine without starting is greater than or equal to 10.0 seconds with the LowFuelConditionDiag</p>	<p>See the table named: P00B6_Fail if power up ECT exceeds RCT by these values in the Supporting tables section</p> <p>= False</p>	<p>No Active DTC's</p> <p>Engine Off Soak Time Propulsion Off Soak Time Non-volatile memory initialization</p> <p>Test complete this trip Test aborted this trip IAT LowFuelCondition Diag</p> <p>===== Block Heater detection is enabled when either of the following occurs: 1) ECT at power up $>$ IAT at power up by 2) Cranking time ===== Block Heater is detected and diagnostic is aborted when 1) or 2) occurs.</p> <p>1a) Vehicle drive time 1b) Vehicle speed 1c) Additional Vehicle drive time is provided to 1a when Vehicle speed is</p>	<p>VehicleSpeedSensor_FA IAT_SensorCircuitFA THMR_RCT_Sensor_Ckt_FA THMR_ECT_Sensor_Ckt_FA IgnitionOffTimeValid TimeSinceEngineRunningValid $>$ 28,800 seconds $>$ 0 seconds = Not occurred = False = False \geq -7 °C = False ===== $>$ 19.3°C $<$ 10.0 Seconds ===== $>$ 400 Seconds with $>$ 14.9MPH and 0.50 times the seconds with vehicle speed below</p>	1 failure 500 msec/ sample Once per valid cold start	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					below 1b as follows: 1d) IAT drops from power up IAT 2a) ECT drops from power up ECT 2b) Engine run time ===== Diagnostic is aborted when 3) or 4) occurs: 3) Engine run time with vehicle speed below 1b 4) Minimum IAT during test	1b ≥ 3.3 °C > 1 °C Within < 30 Seconds ===== > 1800 Seconds ≤ -7.0 °C		

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Mass Air Flow System Performance (naturally aspirated)	P0101	Determines if the MAF sensor is stuck within the normal operating range	Filtered Throttle Model Error AND ABS(Measured Flow – Modeled Air Flow) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	<= 300 kPa*(g/s) > 20 grams/sec > 20.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together)	>= 465 RPM <= 4,600 RPM >= -7 Deg C <= 125 Deg C >= -20 Deg C <= 100 Deg C >= 0.50 Filtered Throttle Model Error multiplied by TPS Residual Weight Factor based on RPM Modeled Air Flow Error multiplied by MAF Residual Weight Factor based on RPM and MAF Residual Weight Factor based on MAF Est MAP Model 2 Error multiplied by MAP2 Residual Weight Factor based on RPM See Residual Weight Factor tables. No Active DTCs: MAP_SensorCircuitFA EGRValvePerformance_F A MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA No Pending DTCs: EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Mass Air Flow Sensor Circuit Low Frequency	P0102	Detects a continuous short to low or a open in either the signal circuit or the MAF sensor	MAF Output	<= 1,950 Hertz (~ 2.60 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> 1.0 seconds >= 300 RPM >= 8.0 Volts >= 1.0 seconds	400 failures out of 500 samples 1 sample every cylinder firing event	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Mass Air Flow Sensor Circuit High Frequency	P0103	Detects a high frequency output from the MAF sensor	MAF Output	>= 13,200 Hertz (~ 1047.9 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> 1.0 seconds >= 300 RPM >= 8.0 Volts >= 1.0 seconds	400 failures out of 500 samples 1 sample every cylinder firing event	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Manifold Pressure	> 115.0 kPa	time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 409.6 seconds EngineModeNotRunTimer Error MAP_SensorFA AAP_SnsrFA MAP_SensorCircuitFP AAP_SnsrCktFP	1 sample every 12.5 msec	

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Manifold Absolute Pressure Sensor Circuit Low	P0107	Detects a continuous short to low or open in either the signal circuit or the MAP sensor.	MAP Voltage	< 3.0% of 5 Volt Range (This is equal to 0.15 Volts or 3.5 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Manifold Absolute Pressure Sensor Circuit High	P0108	Detects an open sensor ground or continuous short to high in either the signal circuit or the MAP sensor.	MAP Voltage	> 90.0 % of 5 Volt Range (This is equal to 4.50 Volts, or 115.1 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit Performance (applications with manifold temperature sensor, but no humidity sensor)	P0111	Detects an IAT sensor that has stuck in range by comparing to IAT2 and engine coolant temperature at startup	ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up ECT – Power Up IAT) > ABS(Power Up ECT – Power Up IAT2)	> 25 deg C	Time between current ignition cycle and the last time the engine was running No Active DTCs:	> 28,800 seconds ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit Low	P0112	Detects a continuous short to ground in the IAT signal circuit or the IAT sensor	Raw IAT Input	< 48 Ohms (~150 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit High	P0113	Detects a continuous open circuit in the IAT signal circuit or the IAT sensor	Raw IAT Input	> 404,973 Ohms (~-60 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Intermittent In-Range	P0114	Detects a noisy or erratic IAT signal circuit or IAT sensor	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT reading - IAT reading from 100 milliseconds previous)	> 80.00 DegC 10 consecutive IAT samples	Continuous		4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temperature (ECT) Sensor Performance	P0116	This DTC detects ECT temp sensor stuck in mid range.	<p>A failure will be reported if any of the following (1-3) occur after the following soak conditions, Engine off time > 28,800 seconds Propulsion system off time > 0 seconds</p> <p>1) ECT at power up > IAT at power up by an IAT based table lookup value (fast fail).</p> <p>2) ECT at power up > IAT at power up by 19.3 Deg C and a block heater has not been detected.</p> <p>3) ECT at power up > IAT at power up by 19.3 Deg C and the time spent cranking the engine without starting is greater than 10.0 seconds with the LowFuelConditionDiag</p>	<p>See the table named: P0116_Fail if power up ECT exceeds IAT by these values in the Supporting tables section</p> <p>= False</p>	<p>No Active DTC's</p> <p>Non-volatile memory initialization</p> <p>Test complete this trip Test aborted this trip IAT LowFuelCondition Diag</p> <p>=====</p> <p>Block Heater detection is enabled when either of the following occurs:</p> <p>1) ECT at power up > IAT at power up by</p> <p>2) Cranking time</p> <p>=====</p> <p>Block Heater is detected and diagnostic is aborted when 1) or 2) occurs:</p> <p>1a) Vehicle drive time</p> <p>1b) Vehicle speed</p> <p>1c) Additional Vehicle drive time is provided to 1a when Vehicle speed is below 1b as follows:</p> <p>1d) IAT drops from power up IAT</p>	<p>VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA IgnitionOffTimeValid</p> <p>= Not occurred</p> <p>= False = False ≥ -7 °C</p> <p>= False</p> <p>=====</p> <p>> 19.3 °C</p> <p>< 10.0 seconds</p> <p>=====</p> <p>> 400 seconds</p> <p>> 14.9 MPH</p> <p>0.00 times the seconds with vehicle speed below 1b</p> <p>≥ 3.3 °C</p>	<p>1 failure</p> <p>500 msec/ sample</p> <p>Once per valid cold start</p>	Type B, 2 Trips

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					2a) ECT drops from power up ECT 2b) Engine run time ===== Diagnostic is aborted when 3) or 4) occurs: 3) Engine run time with vehicle speed below 1b 4) Minimum IAT during test	$\geq 1^{\circ}\text{C}$ Within ≤ 30 seconds ===== > 1800 seconds $\leq -7^{\circ}\text{C}$		

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temp Sensor Circuit Low	P0117	Circuit Continuity This DTC detects a short to ground in the ECT signal circuit or the ECT sensor.	ECT Resistance (@ 150°C)	< 45 Ohms			5 failures out of 6 samples 1 sec/ sample Continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temp Sensor Circuit High	P0118	Circuit Continuity This DTC detects a short to high or open in the ECT signal circuit or the ECT sensor.	ECT Resistance (@ -60°C)	> 419,000 Ohms	Engine run time OR IAT min	> 10.0 seconds ≥ -7.0 °C	5 failures out of 6 samples 1 sec/ sample Continuous	Type B, 2 Trips

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Engine Coolant Temperature (ECT) Sensor Circuit Intermittent	P0119	Circuit Continuity This DTC detects large step changes in the ECT signal circuit or the ECT sensor. Allowable high and low limits are calculated for the next sample based on the previous sample.	ECT temperature step change: 1) positive step change is greater than calculated high limit OR 2) negative step change is lower than calculated low limit. The calculated high and low limits for the next reading use the following calibrations: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit *****Generic Example***** If the last ECT reading was 90 Deg C, the Time constant was calibrated at 10 seconds, the low limit was calibrated to -80 Deg C and the high limit was calibrated to 200 Deg C the calculated limits are 101 Deg C and 73 Deg C. The next reading (after the 90 Deg C reading) must be between 73 Deg C and 101 Deg C to be valid.	13.0 seconds -70.0 Deg C 180.0 Deg C	No Active DTC's	ECT_Sensor_Ckt_FP	3 failures out of 4 samples 1 sec/ sample Continuous	Type B, 2 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Throttle Position Sensor Performance (naturally aspirated)	P0121	Determines if the Throttle Position Sensor input is stuck within the normal operating range	Filtered Throttle Model Error AND ABS(Measured Flow – Modeled Air Flow) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	> 300 kPa*(g/s) > 20 grams/sec <= 20.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together)	>= 465 RPM <= 4,600 RPM > -7 Deg C < 125 Deg C > -20 Deg C < 100 Deg C >= 0.50 Filtered Throttle Model Error multiplied by TPS Residual Weight Factor based on RPM Modeled Air Flow Error multiplied by MAF Residual Weight Factor based on RPM and MAF Residual Weight Factor based on MAF Est See Residual Weight Factor tables. No Active DTCs: MAP_SensorCircuitFA EGRValvePerformance_F A MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA No Pending DTCs: EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
TPS1 Circuit Low	P0122	Detects a continuous or intermittent short or open in TPS1 circuit	TPS1 Voltage <	0.3250		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	79 / 159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
TPS1 Circuit High	P0123	Detects a continuous or intermittent short or open in TPS1 circuit	TPS1 Voltage >	4.750		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	79 / 159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temperature Below Stat Regulating Temperature) (time based method for Dual temp sensor applications	P0128	This DTC detects if the engine coolant temperature rises too slowly due to an ECT or Cooling system fault	<p>Engine run time is accumulated when airflow is ≥ 17 grams per sec during Range #1 or #2:</p> <p>=====</p> <p>Range #1 (Primary) ECT reaches Commanded temperature minus 11 °C when IAT min is < 55 °C and ≥ 10 °C.</p> <p>=====</p> <p>Range #2 (Alternate) ECT reaches Commanded temperature minus 31 °C when IATmin is < 10 °C and ≥ -7 °C.</p> <p>=====</p>	<p>See the two tables named:</p> <p>P0128_Maximum Accumulated Time for IAT and Start-up ECT conditions (Primary Test)</p> <p>and</p> <p>P0128_Maximum Accumulated Time for IAT and Start-up ECT conditions (Alternate Test)</p> <p>in the Supporting tables section</p>	<p>No Active DTC's</p> <p>Engine not run time</p> <p>Engine run time</p> <p>Fuel Condition</p> <p>== Range #1 == (Primary) Test ECT at start run Average AirflowT-Stat Heater duty commanded cycle</p> <p>=====</p> <p>== Range #2 == (Alternate) Test ECT at start run Average AirflowT-Stat Heater duty commanded cycle</p> <p>=====</p>	<p>MAF_SensorFA IAT_SensorFA THMR_RCT_Sensor_Ckt_FA THMR_ECT_Sensor_Ckt_FA</p> <p>$\geq 1,800$ seconds $10 \leq \text{Eng Run Tme} \leq 1,370$ seconds</p> <p>Ethanol ≤ 87 %</p> <p>=====</p> <p>$-40 \leq \text{ECT} \leq 70$ °C ≥ 17.0 gps</p> <p>≤ 0 %</p> <p>=====</p> <p>$-40 \leq \text{ECT} \leq 60$ °C ≥ 17.0 gps</p> <p>≤ 0 %</p> <p>=====</p>	<p>1 failure to set DTC</p> <p>1 sec/ sample</p> <p>Once per ignition key cycle</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit High Voltage Bank 1 Sensor 1	P0132	This DTC determines if the O2 sensor circuit is shorted to high.	Oxygen Sensor Signal	> 1,050 mvolts	== Open Test Criteria == No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel Condition ===== No Active DTC's Low Fuel Condition Diag Fuel Condition Initial delay after Open Test Criteria met (cold start condition) Initial delay after Open Test Criteria met (not cold start condition) Equivalence Ratio Air Per Cylinder Fuel Control State	===== TPS_ThrottleAuthorityDef aulted MAF_SensorFA EthanolCompositionSens or_FA 10.0 < Volts < 32.0 = All Cylinders active = Complete > 5 seconds > 225 seconds ≤ 87 % Ethanol ===== MAP_SensorFA EvapPurgeSolenoidCircuit _FA EvapFlowDuringNonPurg e_FA EvapVentSolenoidCircuit_ FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt _FA FuelInjectorCircuit_FA AIR System FA = False ≤ 87 % Ethanol > 40.0 seconds when engine soak time > 28,800 seconds > 40.0 seconds when engine soak time ≤ 28,800 seconds 0.9922 ≤ ratio ≤ 1.0137 50 ≤ mgram ≤ 700 not = Power Enrichment	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All of the above met for	> 2.0 seconds		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>O2 Heater on for Learned Htr resistance</p> <p>Engine Coolant IAT Engine run Accum</p> <p>Time since any AFM status change Time since Purge On to Off change Time since Purge Off to On change</p> <p>Engine airflow Engine speed Fuel Condition Baro Air Per Cylinder</p> <p>Fuel Control State Closed Loop Active LTM fuel cell Transient Fuel Mass Baro Fuel Control State Fuel State Commanded Proportional Gain</p> <p>=====</p> <p>All of the above met for</p>	<p>in Supporting Tables tab.</p> <p>≥ 40 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")</p> <p>> 50 °C > -40 °C > 120 seconds</p> <p>> 0.0 seconds > 0.0 seconds > 0.0 seconds</p> <p>20 ≤ grams/second ≤ 55 1,200 ≤ RPM ≤ 3,000 < 87 % Ethanol > 70 kpa ≥ 200 mGrams</p> <p>= Closed Loop = TRUE = Enabled ≤ 100.0 mgrams = Not Defaulted not = Power Enrichment DFCO not active</p> <p>≥ 0.0 %</p> <p>=====</p> <p>> 3.5 seconds</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit Insufficient Activity Bank 1 Sensor 1	P0134	This DTC determines if the O2 sensor circuit is open.	Oxygen Sensor Signal	> 1,700 mvolts	No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel Condition	TPS_ThrottleAuthorityDef aulted MAF_SensorFA EthanolCompositionSens or_FA 10.0 < Volts < 32.0 = All Cylinders active = Complete > 5 seconds > 225 seconds ≤ 87 % Ethanol	200 failures out of 250 samples. Frequency: Continuous 100 msec loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Performance Bank 1 Sensor 1	P0135	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	Heater Current outside of the expected range of	0.3 < Amps < 3.1	No Active DTC's System Voltage Heater Warm-up delay O2S Heater device control B1S1 O2S Heater Duty Cycle All of the above met for	ECT_Sensor_FA 10.0 < Volts < 32.0 = Complete = Not active > zero > 120 seconds	8 failures out of 10 samples Frequency: 1 tests per trip 5 seconds delay between tests and 1 second execution rate	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit Low Voltage Bank 1 Sensor 2) (For Dual Bank Exhaust Only	P0137	This DTC determines if the O2 sensor circuit is shorted to low.	Oxygen Sensor Signal	< 50 mvolts	No Active DTC's AIR intrusive test Fuel intrusive test Idle intrusive test EGR intrusive test System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Diag Equivalence Ratio Air Per Cylinder Fuel Control State Closed Loop Active All Fuel Injectors for active Cylinders Fuel Condition Fuel State All of the above met for	TPS_ThrottleAuthorityDef aultedMAP_SensorFAAIR System FAethanol Composition Sensor FAEvapPurgeSolenoidCir cuit_FAEvapFlowDuringN onPurge_FAEvapVentSol enoidCircuit_FAEvapSmal lLeak_FAEvapEmissionSy stem_FAFuelTankPressur eSnsrCkt_FAFuelInjector Circuit_FA = Not active = Not active = Not active = Not active 10.0 < Volts < 32.0 = Not active = Not active = Not active = Not active = False 0.9922 ≤ ratio ≤ 1.0137 50 ≤ mgrams ≤ 700 = Closed Loop = TRUE Enabled (On) Ethanol ≤ 87 % DFCO not active > 2.0 seconds	430 failures out of 540 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit High Voltage Bank 1 Sensor 2) (For Dual Bank Exhaust Only	P0138	This DTC determines if the O2 sensor circuit is shorted to high.	Oxygen Sensor Signal	> 1,050 mvolts	== Open Test Criteria == No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Fuel Condition ===== No Active DTC's Low Fuel Condition Diag Fuel Condition Initial delay after Open Test Criteria met (cold start condition) Initial delay after Open Test Criteria met (not cold start condition) Equivalence Ratio Air Per Cylinder Fuel Control State	===== TPS_ThrottleAuthorityDef aulted MAF_SensorFA EthanolCompositionSens or_FA 10.0 < Volts < 32.0 = All Cylinders active = Complete > 5 seconds ≤ 87 Ethanol ===== MAP_SensorFA EvapPurgeSolenoidCircuit _FA EvapFlowDuringNonPurg e_FA EvapVentSolenoidCircuit_ FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt _FA FuelInjectorCircuit_FA AIR System FA = False ≤ 87 % Ethanol > 40.0 seconds when engine soak time > 28,800 seconds > 40.0 seconds when engine soak time ≤ 28,800 seconds 0.9922 ≤ ratio ≤ 1.0137 50 ≤ mgrams ≤ 700 not = Power Enrichment	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All of the above met for	> 2.0 seconds		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Slow Response Rich to Lean Bank 1 Sensor 2	P013A	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Rich to Lean voltages range during Rich to Lean transition. The diagnostic is an intrusive test which runs in a DFCO mode to achieve the required response.	The EWMA of the Post O2 sensor normalized integral value OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.3 units > 75.0 grams (upper voltage threshold is 500 mvolts and lower voltage threshold is 200 mvolts)	No Active DTC's B1S2 DTC's Not Active this key cycle System Voltage Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell (Decel) Crankshaft Torque	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013B, P013E, P013F, P2270 or P2271 10.0 < Volts < 32.0 = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's") = Not Valid = Not Valid, See definition of Multiple DTC Use_Green Sensor Delay Criteria - Airflow and Multiple DTC Use_Green Sensor Delay Criteria - Limit for the following locations: B1S2, B2S2 (if applicable) in Supporting Tables tab. = False = enabled < 1,000.0 Nm	Frequency: Once per trip Note: if NaPOPD_b_Res etFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_Rap idResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DTC's Passed ===== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	P2270 (and P2272 if applicable) P013E (and P014A if applicable) =====		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Slow Response Lean to Rich Bank 1 Sensor 2	P013B	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Lean to Rich voltages range during Lean to Rich transition. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	The EWMA of the Post O2 sensor normalized integral value OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.3 units > 150 grams (lower voltage threshold is 350 mvolts and upper voltage threshold is 650 mvolts)	No Active DTC's B1S2 DTC's Not Active this key cycle System Voltage Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Green Cat System Condition	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013A, P013E, P013F, P2270 or P2271 10.0 < Volts < 32.0 = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's") = Not Valid = Not Valid, See definition of Multiple DTC Use_Green Sensor Delay Criteria - Airflow and Multiple DTC Use_Green Sensor Delay Criteria - Limit for the following locations: B1S2, B2S2 (if applicable) in Supporting Tables tab. = Not Valid, System is not valid until accumulated airflow is greater than	Frequency: Once per trip Note: if NaPOPD_b_Res etFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>Low Fuel Condition Diag Post fuel cell</p> <p>DTC's Passed</p> <p>=====</p> <p>After above conditions are met: Fuel Enrich mode continued.</p> <p>=====</p> <p>During this test the following must stay TRUE or the test will abort: 0.95 ≤ Fuel EQR ≤ 1.10</p>	<p>720,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C. (Note: This feature is only enabled when the vehicle is new and cannot be enabled in service).</p> <p>= False = enabled</p> <p>P2270 (and P2272 if applicable) P013E (and P014A if applicable) P013A (and P013C if applicable) P2271 (and P2273 if applicable) P013F (and P014B if applicable)</p> <p>=====</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Slow Response Rich to Lean Bank 2 Sensor 2	P013C	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Rich to Lean voltages range during Rich to Lean transition. The diagnostic is an intrusive test which runs in a DFCO mode to achieve the required response.	The EWMA of the Post O2 sensor normalized integral value OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.3 units > 75.0 grams (upper voltage threshold is 500 mvolts and lower voltage threshold is 200 mvolts)	No Active DTC's B2S2 DTC's Not Active this key cycle System Voltage Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell (Decel)	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013D, P014A, P014B, P2272 or P2273 10.0 < Volts < 32.0 = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's") = Not Valid = Not Valid, See definition of Multiple DTC Use_Green Sensor Delay Criteria - Airflow and Multiple DTC Use_Green Sensor Delay Criteria - Limit for the following locations: B1S2, B2S2 in Supporting Tables tab. = False = enabled	Frequency: Once per trip Note: if NaPOPD_b_Res etFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Crankshaft Torque DTC's Passed ===== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	< 1,000.0 Nm P2270 (and P2272 if applicable) P013E (and P014A if applicable) =====		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Slow Response Lean to Rich Bank 2 Sensor 2	P013D	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Lean to Rich voltages range during Lean to Rich transition. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	The EWMA of the Post O2 sensor normalized integral value OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.3 units > 150 grams (lower voltage threshold is 350 mvolts and upper voltage threshold is 650 mvolts)	No Active DTC's B2S2 DTC's Not Active this key cycle System Voltage Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Green Cat System Condition	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013C, P014A, P014B, P2272 or P2273 10.0 < Volts < 32.0 = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's") = Not Valid = Not Valid, See definition of Multiple DTC Use_Green Sensor Delay Criteria - Airflow and Multiple DTC Use_Green Sensor Delay Criteria - Limit for the following locations: B1S2, B2S2 in Supporting Tables tab. = Not Valid, System is not valid until accumulated airflow is greater than	Frequency: Once per trip Note: if NaPOPD_b_Res etFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>Low Fuel Condition Diag Post fuel cell</p> <p>DTC's Passed</p> <p>===== After above conditions are met: Fuel Enrich mode continued. ===== During this test the following must stay TRUE or the test will abort: 0.95 ≤ Fuel EQR ≤ 1.10</p>	<p>720,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C. (Note: This feature is only enabled when the vehicle is new and cannot be enabled in service).</p> <p>= False = enabled</p> <p>P2270 (and P2272 if applicable) P013E (and P014A if applicable) P013A (and P013C if applicable) P2271 (and P2273 if applicable) P013F (and P014B if applicable)</p> <p>===== ===== =====</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Crankshaft Torque DTC's Passed Number of fueled cylinders ===== After above conditions are met: DFCO mode entered (wo driver initiated pedal input).	< 1,000.0 Nm P2270 (and P2272 if applicable) ≤ 6 cylinders =====		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>Low Fuel Condition Diag Post fuel cell</p> <p>DTC's Passed</p> <p>Number of fueled cylinders =====</p> <p>After above conditions are met: Fuel Enrich mode entered. =====</p> <p>During this test the following must stay TRUE or the test will abort: 0.95 ≤ Fuel EQR ≤ 1.10</p>	<p>720,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C. (Note: This feature is only enabled when the vehicle is new and cannot be enabled in service).</p> <p>= False = enabled</p> <p>P2270 (and P2272 if applicable) P013E (and P014A if applicable) P013A (and P013C if applicable) P2271 (and P2273 if applicable)</p> <p>≥ 2 cylinders =====</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit Insufficient Activity Bank 1 Sensor 2) (For Dual Bank Exhaust Only	P0140	This DTC determines if the O2 sensor circuit is open.	Oxygen Sensor Signal	> 1,700 mvolts	No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel Condition	TPS_ThrottleAuthorityDef aulted MAF_SensorFA EthanolCompositionSens or_FA 10.0 < Volts < 32.0 = All Cylinders active = Complete > 5 seconds > 225 seconds ≤ 87 % Ethanol	200 failures out of 250 samples. Frequency: Continuous 100 msec loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Performance Bank 1 Sensor 2) (For Dual Bank Exhaust Only	P0141	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	Heater Current outside of the expected range of	0.3 > amps > 2.9	No Active DTC's System Voltage Heater Warm-up delay O2S Heater device control B1S1 O2S Heater Duty Cycle All of the above met for	ECT_Sensor_FA 10.0 < Volts < 32.0 = Complete = Not active > zero > 120 seconds	8 failures out of 10 samples Frequency: 1 tests per trip 5 seconds delay between tests and 1 second execution rate.	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Crankshaft Torque DTC's Passed Number of fueled cylinders ===== After above conditions are met: DFCO mode entered (wo driver initiated pedal input).	< 1,000.0 Nm P2270 (and P2272 if applicable) ≤ 6 cylinders =====		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>Low Fuel Condition Diag Post fuel cell</p> <p>DTC's Passed</p> <p>Number of fueled cylinders =====</p> <p>After above conditions are met: Fuel Enrich mode entered. =====</p> <p>During this test the following must stay TRUE or the test will abort: 0.95 ≤ Fuel EQR ≤ 1.10</p>	<p>720,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C. (Note: This feature is only enabled when the vehicle is new and cannot be enabled in service).</p> <p>= False = enabled</p> <p>P2270 (and P2272 if applicable) P013E (and P014A if applicable) P013A (and P013C if applicable) P2271 (and P2273 if applicable)</p> <p>≥ 2 cylinders =====</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit Low Voltage Bank 2 Sensor 1	P0151	This DTC determines if the O2 sensor circuit is shorted to low.	Oxygen Sensor Signal	< 50 mvolts	No Active DTC's AIR intrusive test Fuel intrusive test Idle intrusive test EGR intrusive test System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Diag Equivalence Ratio Air Per Cylinder Fuel Control State Closed Loop Active All Fuel Injectors for active Cylinders Fuel Condition Fuel State All of the above met for	TPS_ThrottleAuthority DefaultedMAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit _FA EvapFlowDuringNonPurg e_FA EvapVentSolenoidCircuit_ FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt _FA FuelInjectorCircuit_FA = Not active = Not active = Not active = Not active 10.0 < Volts < 32.0 = Not active = Not active = Not active = Not active = False 0.9922 ≤ equiv. ratio ≤ 1.0137 50 ≤ APC ≤ 700 mgrams = Closed Loop = TRUE Enabled (On) ≤ 87 % Ethanol DFCO not active > 2.0 seconds	380 failures out of 475 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit High Voltage Bank 2 Sensor 1	P0152	This DTC determines if the O2 sensor circuit is shorted to high.	Oxygen Sensor Signal	> 1,050 mvolts	== Open Test Criteria == No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel Condition ===== No Active DTC's Low Fuel Condition Diag Fuel Condition Initial delay after Open Test Criteria met (cold start condition) Initial delay after Open Test Criteria met (not cold start condition) Equivalence Ratio Air Per Cylinder	===== TPS_ThrottleAuthorityDef aulted MAF_SensorFA EthanolCompositionSens or_FA 10.0 < Volts < 32.0 = All Cylinders active = Complete > 5 seconds > 225 seconds <= 87 % Ethanol ===== MAP_SensorFA EvapPurgeSolenoidCircuit _FA EvapFlowDuringNonPurg e_FA EvapVentSolenoidCircuit_ FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt _FA FuelInjectorCircuit_FA AIR System FA = False ≤ 87 % Ethanol > 85.0 seconds when engine soak time > 28,800 seconds > 85.0 seconds when engine soak time ≤ 28,800 seconds 0.9922 ≤ ratio ≤ 1.0137 50 ≤ mgrams ≤ 700	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Fuel Control State All of the above met for	not = Power Enrichment > 2 seconds		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>O2 Heater on for Learned Htr resistance</p> <p>Engine Coolant IAT Engine run Accum</p> <p>Time since any AFM status change Time since Purge On to Off change Time since Purge Off to On change</p> <p>Engine airflow Engine speed Fuel Condition Baro Air Per Cylinder</p> <p>Fuel Control State Closed Loop Active LTM fuel cell Transient Fuel Mass Baro Fuel Control State Fuel State Commanded Proportional Gain</p> <p>=====</p> <p>All of the above met for</p>	<p>Tables tab.</p> <p>≥ 40 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")</p> <p>> 50 °C > -40 °C > 120 seconds</p> <p>> 0.0 seconds > 0.0 seconds > 0.0 seconds</p> <p>20 ≤ grams/second ≤ 55 1,200 ≤ RPM ≤ 3,000 < 87 % Ethanol > 70 kpa >= 200 mGrams</p> <p>= Closed Loop = TRUE = Enabled ≤ 100.0 mgrams = Not Defaulted not = Power Enrichment DFCO not active</p> <p>≥ 0.0 %</p> <p>=====</p> <p>> 3.5 seconds</p>		

14 OBDG12 ECM Summary Tables

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

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit Insufficient Activity Bank 2 Sensor 1	P0154	This DTC determines if the O2 sensor circuit is open.	Oxygen Sensor Signal	> 1,700 mvolts	No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel Condition	TPS_ThrottleAuthorityDef aulted MAF_SensorFA EthanolCompositionSens or_FA 10.0 < Volts < 32.0 = All Cylinders active = Complete > 5 seconds > 225 seconds ≤ 87 % Ethanol	200 failures out of 250 samples. Frequency: Continuous 100 msec loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Performance Bank 2 Sensor 1	P0155	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	Heater Current outside of the expected range of	0.3 > amps > 3.1	No Active DTC's System Voltage Heater Warm-up delay O2S Heater device control B1S1 O2S Heater Duty Cycle All of the above met for	ECT_Sensor_FA 10.0 < Volts < 32.0 = Complete = Not active > zero > 120 seconds	8 failures out of 10 samples Frequency: 1 tests per trip 5 seconds delay between tests and 1 second execution rate	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit High Voltage Bank 2 Sensor 2	P0158	This DTC determines if the O2 sensor circuit is shorted to high.	Oxygen Sensor Signal	> 1,050 mvolts	== Open Test Criteria == No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel Condition ===== No Active DTC's Low Fuel Condition Diag Fuel Condition Initial delay after Open Test Criteria met (cold start condition) Initial delay after Open Test Criteria met (not cold start condition) Equivalence Ratio Air Per Cylinder Fuel Control State	===== TPS_ThrottleAuthorityDef aulted MAF_SensorFA EthanolCompositionSens or_FA 10.0 < Volts < 32.0 = All Cylinders active = Complete > 5 seconds > 225 seconds ≤ 87 % Ethanol ===== MAP_SensorFA EvapPurgeSolenoidCircuit _FA EvapFlowDuringNonPurg e_FA EvapVentSolenoidCircuit_ FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt _FA FuelInjectorCircuit_FA AIR System FA = False ≤ 87 % Ethanol > 85.0 seconds when engine soak time > 28,800 seconds > 85.0 seconds when engine soak time ≤ 28,800 seconds 0.9922 ≤ ratio ≤ 1.0137 50 ≤ mgrams ≤ 700 not = Power Enrichment	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All of the above met for	> 2 seconds		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Delayed Response Rich to Lean Bank 1 Sensor 1	P015A	This DTC determines if the pre catalyst O2 sensor has an initial delayed response to an A/F change from Rich to Lean. The diagnostic is an intrusive test which runs in a DFCO mode to achieve the required response.	The EWMA of the Pre O2 sensor normalized R2L time delay value OR [The Accumulated time monitored during the R2L Delayed Response Test (Gross failure). AND Pre O2 sensor voltage is	> 0.4 EWMA (sec) ≥ 1.8 Seconds > 550 mvolts	No Active DTC's System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Diag Green O2S Condition	TPS_ThrottleAuthorityDefaulted MAP_SensorFA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EthanolCompositionSensor_FA EngineMisfireDetected_FA P0131, P0132, P0134 10.0 < Volts < 32.0 = Not active = Not active = Not active = Not active = False = Not Valid, See definition of Multiple DTC Use_Green Sensor Delay Criteria - Airflow and Multiple DTC Use_Green Sensor Delay Criteria - Limit for	Frequency: Once per trip Note: if NaESPD_b_Fast InitResplsActive = TRUE for the given Fuel Bank OR NaESPD_b_RapidResponsesActive = TRUE, multiple tests per trip are allowed	Type A, 1 Trips EWMA

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>O2 Heater (pre sensor) on for Learned Htr resistance</p> <p>Engine Coolant IAT Engine run Accum</p> <p>Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled)</p> <p>Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled)</p> <p>Closed loop integral Closed Loop Active Evap Ethanol Post fuel cell</p> <p>EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp Fuel State</p>	<p>the following locations: B1S1, B2S1 (if applicable) in Supporting Tables tab.</p> <p>≥ 40 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")</p> <p>> 50 °C > -40 °C > 120 seconds</p> <p>1,100 ≤ RPM ≤ 2,500</p> <p>1,050 ≤ RPM ≤ 2,650</p> <p>3 ≤ gps ≤ 20</p> <p>40.4 ≤ MPH ≤ 82.0</p> <p>36.0 ≤ MPH ≤ 87.0</p> <p>0.74 ≤ C/L Int ≤ 1.08 = TRUE not in control of purge not in estimate mode = enabled</p> <p>= not active</p> <p>= not active</p> <p>≥ 80.0 sec 600 ≤ °C ≤ 900 = DFCO possible</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>=====</p> <p>All of the above met for at least 2.0 seconds, and then the Force Cat Rich intrusive stage is requested.</p> <p>=====</p> <p>Pre O2S voltage B1S1 at end of Cat Rich stage Fuel State Number of fueled cylinders</p> <p>=====</p> <p>After above conditions are met: DFCO Mode is entered (wo driver initiated pedal input).</p>	<p>=====</p> <p>≥ 690 mvolts = DFCO active ≤ 6 cylinders</p> <p>=====</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>O2 Heater (pre sensor) on for Learned Htr resistance</p> <p>Engine Coolant IAT Engine run Accum</p> <p>Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled)</p> <p>Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled)</p> <p>Closed loop integral Closed Loop Active Evap Ethanol Post fuel cell EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp</p>	<p>the following locations: B1S1, B2S1 (if applicable) in Supporting Tables tab.</p> <p>≥ 40 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")</p> <p>> 50 °C > -40 °C > 120 seconds</p> <p>1,100 ≤ RPM ≤ 2,500</p> <p>1,050 ≤ RPM ≤ 2,650</p> <p>3 ≤ gps ≤ 20</p> <p>40.4 ≤ MPH ≤ 82.0</p> <p>36.0 ≤ MPH ≤ 87.0</p> <p>0.74 ≤ C/L Int ≤ 1.08 = TRUE not in control of purge not in estimate mode = enabled = not active = not active ≥ 80.0 sec</p> <p>600 ≤ °C ≤ 900</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Fuel State Number of fueled cylinders ===== When above conditions are met: Fuel Enrich mode is entered. ===== During this test: Engine Airflow must stay between: and the delta Engine Airflow over 12.5msec must be :	= DFCO inhibit ≥ 2 cylinders ===== ===== 6 ≤ gps ≤ 20 ≤ 1.5 gps		

14 OBDG12 ECM Summary Tables

Component/System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Delayed Response Rich to Lean Bank 2 Sensor 1	P015C	This DTC determines if the pre catalyst O2 sensor has an initial delayed response to an A/F change from Rich to Lean. The diagnostic is an intrusive test which runs in a DFCO mode to achieve the required response.	The EWMA of the Pre O2 sensor normalized R2L time delay value OR [The Accumulated time monitored during the R2L Delayed Response Test (Gross failure). AND Pre O2 sensor voltage is above]	> 0.4 EWMA (sec) ≥ 1.8 Seconds > 550 mvolts	No Active DTC's System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Diag Green O2S Condition	TPS_ThrottleAuthorityDefaulted MAP_SensorFA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EthanolCompositionSensor_FA EngineMisfireDetected_FA P0131, P0132, P0134 10.0 < Volts < 32.0 = Not active = Not active = Not active = Not active = False = Not Valid, See definition of Multiple DTC Use_Green Sensor Delay Criteria - Airflow and Multiple DTC Use_Green Sensor Delay Criteria - Limit for	Frequency: Once per trip Note: if NaESPD_b_Fast InitResplsActive = TRUE for the given Fuel Bank OR NaESPD_b_RapidResponsesActive = TRUE, multiple tests per trip are allowed	Type A, 1 Trips EWMA

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>O2 Heater (pre sensor) on for Learned Htr resistance</p> <p>Engine Coolant IAT</p> <p>Engine run Accum</p> <p>Engine Speed to initially enable test</p> <p>Engine Speed range to keep test enabled (after initially enabled)</p> <p>Engine Airflow</p> <p>Vehicle Speed to initially enable test</p> <p>Vehicle Speed range to keep test enabled (after initially enabled)</p> <p>Closed loop integral Closed Loop Active</p> <p>Evap Ethanol Post fuel cell</p> <p>EGR Intrusive diagnostic All post sensor heater delays</p> <p>O2S Heater (post sensor) on Time</p> <p>Predicted Catalyst temp</p>	<p>the following locations: B1S1, B2S1 in Supporting Tables tab.</p> <p>≥ 40 seconds</p> <p>= Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")</p> <p>> 50 °C</p> <p>> -40 °C</p> <p>> 120 seconds</p> <p>1,100 ≤ RPM ≤ 2,500</p> <p>1,050 ≤ RPM ≤ 2,650</p> <p>3 ≤ gps ≤ 20</p> <p>40.4 ≤ MPH ≤ 82.0</p> <p>36.0 ≤ MPH ≤ 87.0</p> <p>0.74 ≤ C/L Int ≤ 1.08</p> <p>= TRUE</p> <p>not in control of purge</p> <p>not in estimate mode</p> <p>= enabled</p> <p>= not active</p> <p>= not active</p> <p>≥ 80.0 sec</p> <p>600 ≤ °C ≤ 900</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Fuel State ===== All of the above met for at least 2.0 seconds, and then the Force Cat Rich intrusive stage is requested. ===== Pre O2S voltage B1S1 at end of Cat Rich stage Fuel State Number of fueled cylinders ===== After above conditions are met: DFCO Mode is entered (wo driver initiated pedal input).	= DFCO possible ===== ===== ≥ 690 mvolts = DFCO active ≤ 6 cylinders =====		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>O2 Heater (pre sensor) on for Learned Htr resistance</p> <p>Engine Coolant IAT Engine run Accum</p> <p>Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled)</p> <p>Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled)</p> <p>Closed loop integral Closed Loop Active Evap Ethanol Post fuel cell EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time</p> <p>Predicted Catalyst temp Fuel State</p>	<p>the following locations: B1S1, B2S1 in Supporting Tables tab.</p> <p>≥ 40 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")</p> <p>> 50 °C > -40 °C > 120 seconds</p> <p>1,100 ≤ RPM ≤ 2,500</p> <p>1,050 ≤ RPM ≤ 2,650</p> <p>3 ≤ gps ≤ 20</p> <p>40.4 ≤ MPH ≤ 82.0</p> <p>36.0 ≤ MPH ≤ 87.0</p> <p>0.74 ≤ C/L Int ≤ 1.08 = TRUE not in control of purge not in estimate mode = enabled = not active = not active</p> <p>≥ 80.0 sec</p> <p>600 ≤ °C ≤ 900 = DFCO inhibit</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Number of fueled cylinders ===== When above conditions are met: Fuel Enrich mode is entered. ===== During this test: Engine Airflow must stay between: and the delta Engine Airflow over 12.5msec must be :	≥ 2 cylinders ===== $6 \leq \text{gps} \leq 20$ ≤ 1.5 gps		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit Insufficient Activity Bank 2 Sensor 2	P0160	This DTC determines if the O2 sensor circuit is open.	Oxygen Sensor Signal	> 1,700 mvolts	No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel Condition	TPS_ThrottleAuthorityDef aulted MAF_SensorFA EthanolCompositionSens or_FA 10.0 < Volts < 32.0 = All Cylinders active = Complete > 5 seconds > 225 seconds ≤ 87 % Ethanol	200 failures out of 250 samples. Frequency: Continuous 100 msec loop	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Heater Performance Bank 2 Sensor 2	P0161	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	Heater Current outside of the expected range of	0.3 > amps > 2.9	No Active DTC's System Voltage Heater Warm-up delay O2S Heater device control B1S1 O2S Heater Duty Cycle All of the above met for	ECT_Sensor_FA 10.0 < Volts < 32.0 = Complete = Not active > zero > 120 seconds	8 failures out of 10 samples Frequency: 1 tests per trip 5 seconds delay between tests and 1 second execution rate	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Device Control EVAP Diag. No active DTC:	Not Active "tank pull down" Not Active IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR_System FA EvapExcessPrgePsbl_FA Ethanol Comp Snsr FA FuelInjectorCkt_FA EngMisfireDetected_FA EGRValvePerf_FA EGRValveCkt_FA MAP_EngVacuumStatus AmbPresDfltStatus TC_BoostPresSnsrFA O2Snsr_B1_Snsr_1_FA		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel System Too Rich Bank 1	P0172	<p>Determines if the fuel control system is in a rich condition, based on the filtered long-term fuel trim metric.</p> <p>There are two methods to determine a Rich fault. They are Passive and Intrusive. A Passive Test decision can be made up until the time that purge is first enabled. From that point forward, rich faults can only be detected by turning purge off intrusively.</p> <p>Intrusive Test: If the filtered Purge Long Term Fuel Trim metric > 0.715 , the test passes without intrusively checking the filtered Non-Purge Long Term Fuel Trim metric. However if the filtered Purge Long Term Fuel Trim metric is <= 0.715 , purge is ramped off to determine if excess purge vapor is the cause of the rich condition.</p> <p>Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions,</p>	<p>Passive Test: The filtered Non-Purge Long Term Fuel Trim metric</p> <p>AND</p> <p>The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria)</p> <p>Intrusive Test: For 3 out of 5 intrusive segments, the filtered Purge Long Term Fuel Trim metric</p> <p>AND</p> <p>The filtered Non-Purge Long Term Fuel Trim metric</p> <p>AND</p> <p>The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria)</p> <p>Segment Def'n: Segments can last up to 30 seconds and are separated by the lesser of 20 seconds of purge-on time or enough time to</p>	<p><= 0.710</p> <p><= 2.000</p> <p><= 0.715</p> <p><= 0.710</p> <p><= 2.000</p>		<p>Secondary Parameters and Enable Conditions are identical to those for P0171, with the exception that fuel level is not considered.</p>	<p>Frequency: 100 ms Continuous Loop</p>	<p>Type B, 2 Trips</p>

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		and the execution frequency of other diagnostics.	purge 16 grams of vapor. A maximum of 5 completed segments or 20 attempts are allowed for each intrusive test. After an intrusive test report is completed, another intrusive test cannot occur for 300 seconds to allow sufficient time to purge excess vapors from the canister. During this period, fuel trim will pass if the filtered Purge Long Term Fuel Trim metric > 0.715 for at least 200 seconds, indicating that the canister has been purged.					

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					EVAP Diag. No active DTC:	"tank pull down" Not Active IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR_System FA EvapExcessPrgePsbL_FA Ethanol Comp Snsr FA FuelInjectorCkt_FA EngMisfireDetected_FA EGRValvePerf_FA EGRValveCkt_FA MAP_EngVacuumStatus AmbPresDfltStatus TC_BoostPresSnsrFA O2Snsr_B2_Snsr_1_FA		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel System Too Rich Bank 2	P0175	<p>Determines if the fuel control system is in a rich condition, based on the filtered long-term fuel trim metric.</p> <p>There are two methods to determine a Rich fault. They are Passive and Intrusive. A Passive Test decision can be made up until the time that purge is first enabled. From that point forward, rich faults can only be detected by turning purge off intrusively.</p> <p>Intrusive Test: If the filtered Purge Long Term Fuel Trim metric > 0.715 , the test passes without intrusively checking the filtered Non-Purge Long Term Fuel Trim metric. However if the filtered Purge Long Term Fuel Trim metric is <= 0.715 , purge is ramped off to determine if excess purge vapor is the cause of the rich condition.</p> <p>Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions,</p>	<p>Passive Test: The filtered Non-Purge Long Term Fuel Trim metric</p> <p>AND</p> <p>The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria)</p> <p>Intrusive Test: For 3 out of 5 intrusive segments, the filtered Purge Long Term Fuel Trim metric</p> <p>AND</p> <p>The filtered Non-Purge Long Term Fuel Trim metric</p> <p>AND</p> <p>The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria)</p> <p>Segment Def'n: Segments can last up to 30 seconds and are separated by the lesser of 20 seconds of purge-on time or enough time to</p>	<p><= 0.710</p> <p><= 2.000</p> <p><= 0.715</p> <p><= 0.710</p> <p><= 2.000</p>		<p>Secondary Parameters and Enable Conditions are identical to those for P0174, with the exception that fuel level is not considered.</p>	<p>Frequency: 100 ms Continuous Loop</p>	<p>Type B, 2 Trips</p>

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		and the execution frequency of other diagnostics.	<p>purge 16 grams of vapor.</p> <p>A maximum of 5 completed segments or 20 attempts are allowed for each intrusive test.</p> <p>After an intrusive test report is completed, another intrusive test cannot occur for 300 seconds to allow sufficient time to purge excess vapors from the canister. During this period, fuel trim will pass if the filtered Purge Long Term Fuel Trim metric > 0.715 for at least 200 seconds, indicating that the canister has been purged.</p>					

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Open Circuit (PFI) - 3 DTC Implementation	P0201	This DTC Diagnoses Injector 1 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0261 may also set (Injector 1 Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Open Circuit (PFI) - 3 DTC Implementation	P0202	This DTC Diagnoses Injector 2 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0264 may also set (Injector 2 Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Open Circuit (PFI) - 3 DTC Implementation	P0203	This DTC Diagnoses Injector 3 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0267 may also set (Injector 3 Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Open Circuit (PFI) - 3 DTC Implementation	P0204	This DTC Diagnoses Injector 4 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0270 may also set (Injector 4 Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 5 Open Circuit (PFI) - 3 DTC Implementation	P0205	This DTC Diagnoses Injector 5 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0273 may also set (Injector 5 Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 Open Circuit (PFI) - 3 DTC Implementation	P0206	This DTC Diagnoses Injector 6 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0276 may also set (Injector 6 Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 7 Open Circuit (PFI) - 3 DTC Implementation	P0207	This DTC Diagnoses Injector 7 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0279 may also set (Injector 7 Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 8 Open Circuit (PFI) - 3 DTC Implementation	P0208	This DTC Diagnoses Injector 8 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0282 may also set (Injector 8 Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
TPS2 Circuit Low	P0222	Detects a continuous or intermittent short or open in TPS2 circuit	TPS2 Voltage <	0.250		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	79 / 159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
TPS2 Circuit High	P0223	Detects a continuous or intermittent short or open in TPS2 circuit	TPS2 Voltage >	4.590		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	79 / 159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Low side circuit shorted to ground (PFI)	P0261	This DTC Diagnoses Injector 1 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0201 may also set (Injector 1 Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Low side circuit shorted to power (PFI)	P0262	This DTC Diagnoses Injector 1 low side driver circuit for circuit faults.	Voltage high during driver on state indicates short to power	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Low side circuit shorted to ground (PFI)	P0264	This DTC Diagnoses Injector 2 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0202 may also set (Injector 2 Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Low side circuit shorted to power (PFI)	P0265	This DTC Diagnoses Injector 2 low side driver circuit for circuit faults.	Voltage high during driver on state indicates short to power	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Low side circuit shorted to ground (PFI)	P0267	This DTC Diagnoses Injector 3 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0203 may also set (Injector 3 Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Low side circuit shorted to power (PFI)	P0268	This DTC Diagnoses Injector 3 low side driver circuit for circuit faults.	Voltage high during driver on state indicates short to power	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Low side circuit shorted to ground (PFI)	P0270	This DTC Diagnoses Injector 4 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0204 may also set (Injector 4 Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Low side circuit shorted to power (PFI)	P0271	This DTC Diagnoses Injector 4 low side driver circuit for circuit faults.	Voltage high during driver on state indicates short to power	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 5 Low side circuit shorted to ground (PFI)	P0273	This DTC Diagnoses Injector 4 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0205 may also set (Injector 5 Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 5 Low side circuit shorted to power (PFI)	P0274	This DTC Diagnoses Injector 5 low side driver circuit for circuit faults.	Voltage high during driver on state indicates short to power	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 Low side circuit shorted to ground (PFI)	P0276	This DTC Diagnoses Injector 6 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0206 may also set (Injector 6 Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 Low side circuit shorted to power (PFI)	P0277	This DTC Diagnoses Injector 6 low side driver circuit for circuit faults.	Voltage high during driver on state indicates short to power	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 7 Low side circuit shorted to ground (PFI)	P0279	This DTC Diagnoses Injector 7 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0207 may also set (Injector 7 Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 7 Low side circuit shorted to power (PFI)	P0280	This DTC Diagnoses Injector 7 low side driver circuit for circuit faults.	Voltage high during driver on state indicates short to power	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 8 Low side circuit shorted to ground (PFI)	P0282	This DTC Diagnoses Injector 8 low side driver circuit for circuit faults.	Voltage low during driver off state indicates short- to-ground or open circuit	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips Note: In certain controlle rs P0208 may also set (Injector 8 Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 8 Low side circuit shorted to power (PFI)	P0283	This DTC Diagnoses Injector 8 low side driver circuit for circuit faults.	Voltage high during driver on state indicates short to power	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage within range for a duration Engine Running	>= 11 Volts >= 5 Seconds >= 0 Seconds	50 failures out of 63 samples 100 ms /sample Continuous	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Random Misfire Detected	P0300	These DTC's will determine if a random or a cylinder specific misfire is occurring by monitoring various terms derived from crankshaft velocity. The rate of misfire over an interval is compared to both emissions and catalyst damaging thresholds. The pattern of crankshaft acceleration after the misfire is checked to differentiate between real misfire and other sources of crank shaft noise.	Deceleration Value vs. Engine Speed and Engine load The equation used to calculate deceleration value is tailored to specific vehicle operating conditions. The selection of the equation used is based on the 1st tables encountered that are not max of range. If all tables are max of range at a given speed/load, that speed load region is an Undetectable region see Algorithm Description Document for additional details.	[(>IdleSCD_Decel AND > IdleSCD_Jerk) OR (>SCD_Decel AND > SCD_Jerk) OR (>IdleCylModeDecel AND > IdleCylModeJerk) OR (>CylMode_Decel AND > CylMode_Jerk) OR (>RevMode_Decel) OR WHILE in Cylinder Deactivation mode: (> AFM_Decel)] - see details on Supporting Tables Tab (P0300 Section)	Engine Run Time Engine Coolant Temp Or If ECT at startup Then ECT System Voltage + Throttle delta - Throttle delta Early Termination option: (used on plug ins that may not have enough engine run time at end of trip for normal interval to complete.)	> 2 crankshaft revolution -7 °C < ECT < 130 °C < -7 °C 21 °C < ECT < 130 °C 9.00 < volts < 32.00 < 85.00 % per 25 ms < 85.00 % per 25 ms Not Enabled	Emission Exceedence = any (5) failed 200 rev blocks out of (16) 200 rev block tests Failure reported for (1) Exceedence in 1st (16) 200 rev block tests, or (4) Exceedences thereafter. OR when Early Termination Reporting = Enabled and engine rev > 1,000 revs and < 3,200 revs at end of trip any Catalyst Exceedence = (1) 200 rev block as data supports for catalyst damage. Failure reported with (1 or 3) Exceedences in FTP, or (1) Exceedence outside FTP.	Type B, 2 Trips (Mil Flashes with Catalyst damage level of Misfire)
Cylinder 1 Misfire Detected	P0301							
Cylinder 2 Misfire Detected	P0302							
Cylinder 3 Misfire Detected	P0303							
Cylinder 4 Misfire Detected	P0304							
Cylinder 5 Misfire Detected	P0305							
Cylinder 6 Misfire Detected	P0306							
Cylinder 7 Misfire Detected	P0307							
Cylinder 8 Misfire Detected	P0308							
		Misfire Percent Catalyst Damage		> Catalyst_Damage_Misfire_Percentage in Supporting Tables	(at low speed/loads, one cylinder may not cause cat damage)			

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			When engine speed and load are less than the FTP calcs (3) catalyst damage exceedences are allowed.	whenever secondary conditions are met. ≤ 0 FTP rpm AND ≤ 0 FTP % load	Engine Speed Engine Load Misfire counts	$> 1,200$ rpm AND > 20 % load AND < 180 counts on one cylinder	Continuous	
				disable conditions:	Engine Speed	$350 < \text{rpm} < ((\text{Engine Over Speed Limit}) - 400)$ Engine speed limit is a function of inputs like Gear and temperature see EngineOverSpeedLimit in supporting tables	4 cycle delay	
					No active DTCs:	TPS_FA EnginePowerLimited MAF_SensorTFTKO MAP_SensorTFTKO IAT_SensorTFTKO ECT_Sensor_Ckt_TFTKO 5VoltReferenceB_FA CrankSensorTFTKO CrankSensorFA CamLctnIntFA CamLctnExhFA CamSensorAnyLctnTFTKO O AnyCamPhaser_FA AnyCamPhaser_TFTKO AmbPresDfltStatus	4 cycle delay	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P0315 & engine speed	> 1,000 rpm	4 cycle delay	
					Fuel Level Low	LowFuelConditionDiagnostic	500 cycle delay	
					Cam and Crank Sensors	in sync with each other	4 cycle delay	
					Misfire requests TCC unlock	Not honored because Transmission in hot mode or POPD intrusive diagnostic running	4 cycle delay	
					Fuel System Status	≠ Fuel Cut	4 cycle delay	
					Active FuelManagement	Transition in progress	7 cycle delay	
					Undetectable engine speed and engine load region	Undetectable region from Malfunction Criteria	4 cycle delay	
					Abusive Engine Over Speed	> 8,192 rpm	0 cycle delay	
					Below zero torque (except CARB approved 3000 rpm to redline triangle.)	< ZeroTorqueEngLoad in Supporting Tables	4 cycle delay	
					Below zero torque: TPS Vehicle Speed	≤ 1 % > 30 mph	4 cycle delay	
					EGR Intrusive test	Active	0 cycle delay	
					Manual Trans	Clutch shift	4 cycle delay	
					Accel Pedal Position AND Automatic transmission shift	> 95.00 %	7 cycle delay	
					Driveline Ring Filter active			

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.</p> <p>Filter Driveline ring:</p> <p>Stop filter early:</p> <p>Abnormal engine speed oscillations: (Rough road etc) Off Idle, number of consecutive decelerating cylinders after "misfire": (Number of decels can vary with misfire detection equation)</p> <p>TPS Engine Speed Veh Speed</p> <p>Consecutive decels while in SCD Mode Cyl Mode Rev Mode</p> <p>Misfire Crankshaft Pattern Recognition checks each "misfire" candidate in 100 engine Cycle test to see if it looks like real misfire, or some disturbance like rough road. The check is</p>	<p>> "Ring Filter" # of engine cycles after misfire in Supporting Tables</p> <p>> "Number of Normals" # of engine cycles after misfire in Supporting Tables tab</p> <p>> 3 % > 950 rpm > 3 mph</p> <p>> Abnormal SCD Mode > Abnormal Cyl Mode > Abnormal Rev Mode in Supporting Tables</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>based on a multiplier times the ddt_jerk value used to detect misfire at that speed and load. At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present.</p> <p>Pattern Recog Enabled: Engine Speed Veh Speed</p> <p>"misfire" unrecognized if: Crankshaft snap after: isolated "misfire" repetative "misfire"</p> <p>Ratio of Unrecog/Recog</p> <p>Rough Road: Non-Crankshaft based:</p> <p>Rough Road Source</p> <p>IF Rough Road Source = WheelSpeedInECM ABS/TCS Wheel speed noise VSES</p> <p>IF Rough Road Source = "FromABS" ABS/TCS RoughRoad VSES</p> <p>IF Rough Road Source = "TOSS"</p>	<p>Enabled 900 < rpm < 3,000 > 0.6 mph</p> <p>> Min_PatternMultiplier > Max_PatternMultiplier in Supporting Tables</p> <p>> 0.60</p> <p>Enabled</p> <p>Wheel Speed processed in ABS</p> <p>active > WSSRoughRoadThres active</p> <p>active detected active</p>	<p>discard test</p> <p>discard test</p> <p>discard test</p>	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					TOSS dispersion AND No Active DTCs	> TOSSRoughRoadThres in supporting tables Transmission Output Shaft Angular Velocity Validity TransmissionEngagedStat e_FA (Auto Trans only) Clutch Sensor FA (Manual Trans only)	discard test 4 cycle delay	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position System Variation Not Learned	P0315	Monitor for valid crankshaft error compensation factors	Sum of Compensation factors. Each Cylinder pair shares one compensation factor. A perfect factor would be 1.0000. Unlearned factors are defaulted out of range so the sum of factors would be out of range.	≥ 4.0040 OR ≤ 3.9960	OBD Manufacturer Enable Counter	MEC = 0	0.50 seconds Frequency Continuous100 msec	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.	
Knock Sensor (KS) Performance Per Cylinder	P0324	This diagnostic checks for knock sensor performance out of the normal expected range on a per cylinder basis due to: 1. Excessive knock or 2. Abnormal engine noise or 3. Flat signal	Common Enable Criteria (Applies to all 3 parts of the performance diag)		Diagnostic Enabled?	Yes		Type B, 2 Trips	
			Specific Enable Criteria and Thresholds for 3 individual parts of the performance diag:		Engine Run Time	≥ 2.0 seconds			First Order Lag Filters with Weight Coefficients
			1. Excessive Knock Diag: Filtered Knock Intensity	> 1.70 (no units)	Engine Speed	≤ 8,500 RPM			
		VaKNKD_k_PerfCylKnock IntFilt (where 'Knock Intensity' = 0 with no knock; and > 0 & proportional to knock magnitude with knock)		Cumulative Number of Engine Revs Above Min Eng Speed (per key cycle)	≥ 10 mg/cylinder and ≤ 2,000 mg/cylinder		Excessive Knk Weight Coefficient = 0.0480	Updated each engine event	
		2. Abnormal Noise Diag: Filtered FFT Intensity (where 'FFT Intensity' = Non-knocking, background noise)		Individual Cylinders enabled for Abnormal Noise	≥ -40 deg's C		See AbnormalNoise_CylsEnabled (Supporting Tables)	Abn Noise Weight Coefficient = 0.0480	
				Engine Speed	≥ -40 deg's C		Engine Speed	Updated each engine event	
				Cumulative Number of Engine Revs Above Min Eng Speed (per key			≥ 1,500 RPM		
							≥ 84 Revs		
							≥ 84 Revs		
							≥ 2,500 RPM		
							≥ 84 Revs		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			----- 3. Flat Signal Diag: Filtered Signal Delta (Current FFT Intensity - Ave_Intensity_No-Knock) VaKNKD_k_PerfCylFlatFil tInt	< 0.008 (no units)	cycle) ----- Engine Speed Cumulative Number of Engine Revs Above Min Eng Speed (per keycycle)	----- ≥ 8,500 RPM ≥ 400 Revs	----- Flat Signal Weight Coefficient = 0.010 Updated each engine event	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Knock Sensor (KS) Circuit Bank 1	P0325	<p>This diagnostic checks for an open in the knock sensor circuit</p> <p>There are two possible methods used:</p> <ol style="list-style-type: none"> 1. 20 kHz 2. Normal Noise <p>See Supporting Tables for method definition: P0325_P0330_OpenMethod</p> <p>Typical implementations:</p> <ol style="list-style-type: none"> A. Use 20 kHz method at all RPM (used when acceptable separation achieved at all RPM) or B. Use 20 kHz method at low/medium RPM and Normal Noise at high RPM 	Filtered FFT Output	<p>> OpenCktThrshMin and < OpenCktThrshMax</p> <p>See Supporting Tables</p> <p>Thresholds for OpenMethod = 20 kHz: OpenCktThrshMin (20 kHz) & OpenCktThrshMax (20 kHz)</p> <p>Thresholds for OpenMethod = NormalNoise: OpenCktThrshMin (Normal Noise) & OpenCktThrshMax (Normal Noise)</p>	<p>Diagnostic Enabled?</p> <p>Engine Run Time</p> <p>Engine Speed</p> <p>Cumulative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above)</p> <p>Engine Air Flow</p> <p>ECT</p> <p>IAT</p>	<p>Yes</p> <p>≥ 2.0 seconds</p> <p>≥ 400 RPM and ≤ 8,500 RPM</p> <p>≥ 100 revs</p> <p>≥ 10 mg/cylinder and ≤ 2,000 mg/cylinder</p> <p>≥ -40 deg's C</p> <p>≥ -40 deg's C</p>	<p>First Order Lag Filter with Weight Coefficient</p> <p>Weight Coefficient = 0.0100</p> <p>Updated each engine event</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Knock Sensor (KS) Performance Bank 1	P0326	This diagnostic checks for knock sensor performance out of the normal expected range, on a per sensor basis, due to 1. Excessive knock or 2. Abnormal engine noise or 3. Flat signal	Common Enable Criteria (Applies to all 3 parts of the performance diag)		Diagnostic Enabled?	Yes		Type B, 2 Trips
			Specific Enable Criteria and Thresholds for 3 individual parts of the performance diag:		Engine Run Time	≥ 2.0 seconds		
					Engine Speed	≤ 8,500 RPM		
					Engine Air Flow	≥ 10 mg/cylinder and ≤ 2,000 mg/cylinder		
					ECT	≥ -40 deg's C		
					IAT	≥ -40 deg's C		
			1. Excessive Knock Diag: Filtered Knock Intensity	> 1.50 (no units)	Engine Speed	≥ 1,500 RPM	First Order Lag Filters with Weight Coefficients	
			(where 'Knock Intensity' = 0 with no knock; and > 0 & proportional to knock magnitude with knock)		Cumulative Number of Engine Revs Above Min Eng Speed (per key cycle)	≥ 167 Revs	Excessive Knk Weight Coefficient = 0.0060	Updated each engine event
			2. Abnormal Noise Diag: Filtered FFT Intensity: (where 'FFT Intensity' = Non-knocking, background noise)	< AbnormalNoise_Threshold (see Supporting Tables)	Individual Cylinders enabled for Abnormal Noise	See AbnormalNoise_CylsEnabled (Supporting Tables)	Abnormal Noise Weight Coefficient = 0.0060	
					Engine Speed	≥ 2,500 RPM	Updated each engine event	
					Cumulative Number of Engine Revs Above Min Eng Speed (per key	≥ 167 Revs		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			----- 3. Flat Signal Diag: Filtered Signal Delta (Current FFT Intensity - Ave_Intensity_No-Knock)	----- < 0.008 (no units)	cycle) ----- Engine Speed Cumulative Number of Engine Revs Above Min Eng Speed (per keycycle)	----- ≥ 8,500 RPM ≥ 100 Revs	----- Flat Signal Weight Coefficient = 0.010 Updated each engine event	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Knock Sensor (KS) Circuit Low Bank 1	P0327	This diagnostic checks for an out of range low knock sensor signal	Sensor Input or Return Signal Line	< 8.0 Percent (of 5 V reference)	Diagnostic Enabled? Engine Speed	Yes > 0 RPM and < 8,500 RPM	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Knock Sensor (KS) Circuit High Bank 1	P0328	This diagnostic checks for an out of range high knock sensor signal	Sensor Input or Return Signal Line	> 39.0 Percent (of 5 Volt Reference)	Diagnostic Enabled? Engine Speed	Yes > 0 RPM and < 8,500 RPM	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Knock Sensor (KS) Circuit Bank 2	P0330	<p>This diagnostic checks for an open in the knock sensor circuit</p> <p>There are two possible methods used:</p> <ol style="list-style-type: none"> 1. 20 kHz 2. Normal Noise <p>See Supporting Tables for method definition: P0325_P0330_OpenMethod</p> <p>Typical implementations:</p> <ol style="list-style-type: none"> A. Use 20 kHz method at all RPM (used when acceptable separation achieved at all RPM) or B. Use 20 kHz method at low/medium RPM and Normal Noise at high RPM 	Filtered FFT Output	<p>> OpenCktThrshMin and < OpenCktThrshMax</p> <p>See Supporting Tables</p> <p>Thresholds for OpenMethod = 20 kHz: OpenCktThrshMin (20 kHz) & OpenCktThrshMax (20 kHz)</p> <p>Thresholds for OpenMethod = NormalNoise: OpenCktThrshMin (Normal Noise) & OpenCktThrshMax (Normal Noise)</p>	<p>Diagnostic Enabled?</p> <p>Engine Run Time</p> <p>Engine Speed</p> <p>Cumulative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above)</p> <p>Engine Air Flow</p> <p>ECT</p> <p>IAT</p>	<p>Yes</p> <p>≥ 2.0 seconds</p> <p>≥ 400 RPM and ≤ 8,500 RPM</p> <p>100 revs</p> <p>≥ 10 mg/cylinder and ≤ 2,000 mg/cylinder</p> <p>≥ -40 deg's C</p> <p>≥ -40 deg's C</p>	<p>First Order Lag Filter with Weight Coefficient</p> <p>Weight Coefficient = 0.0100</p> <p>Updated each engine event</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Knock Sensor (KS) Performance Bank 2	P0331	This diagnostic checks for knock sensor performance out of the normal expected range, on a per sensor basis, due to 1. Excessive knock or 2. Abnormal engine noise on a per bank basis or 3. Flat signal	Common Enable Criteria (Applies to all 3 parts of the performance diag)		Diagnostic Enabled?	Yes		Type B, 2 Trips
			Specific Enable Criteria and Thresholds for 3 individual parts of the performance diag:		Engine Run Time	≥ 2.0 seconds		
			1. Excessive Knock Diag: Filtered Knock Intensity (where 'Knock Intensity' = 0 with no knock; and > 0 & proportional to knock magnitude with knock)	> 1.50 (no units)	Engine Speed	≤ 8,500 RPM	Engine Air Flow	
		2. Abnormal Noise Diag: Filtered FFT Intensity: (where 'FFT Intensity' = Non-knocking, background noise)	< AbnormalNoise_Threshold (see Supporting Tables)		Cumulative Number of Engine Revs Above Min Eng Speed (per key cycle)	≥ 167 Revs		Excessive knk Weight Coefficient = 0.0060 Updated each engine event
					Individual Cylinders enabled for Abnormal Noise	See AbnormalNoise_CylsEnabled (Supporting Tables)		Abnormal Noise Weight Coefficient =
					Engine Speed	≥ 2,500 RPM		0.0060
					Cumulative Number of Engine Revs Above Min Eng Speed (per key cycle)	≥ 167 Revs		Updated each engine event

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			----- 3. Flat Signal Diag: Filtered Signal Delta (Current FFT Intensity - Ave_Intensity_No-Knock)	----- < 0.008 (no units)	----- Engine Speed Cumlative Number of Engine Revs Above Min Eng Speed (per keycycle)	----- ≥ 8,500 RPM ≥ 100 Revs	----- Flat Signal Weight Coefficient = 0.010 Updated each engine event	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Knock Sensor (KS) Circuit Low Bank 2	P0332	This diagnostic checks for an out of range low knock sensor signal	Sensor Input or Return Signal Line	< 8.0 Percent (of 5 Volt Reference)	Diagnostic Enabled? Engine Speed	Yes > 0 RPM and < 8,500 RPM	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Knock Sensor (KS) Circuit High Bank 2	P0333	This diagnostic checks for an out of range high knock sensor signal	Sensor Input or Return Signal Line	> 39.00 Percent (of 5 Volt Reference)	Diagnostic Enabled? Engine Speed	Yes > 0 RPM and < 8,500 RPM	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position (CKP) Sensor A Circuit	P0335	Determines if a fault exists with the crank position sensor signal	Time since last crankshaft position sensor pulse received	>= 4.0 seconds	Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	= FALSE = FALSE = FALSE > 3.0 grams/second))	Continuous every 100 msec	Type B, 2 Trips
			No crankshaft pulses received	>= 0.3 seconds	Engine is Running Starter is not engaged No DTC Active:	5VoltReferenceB_FA	Continuous every 12.5 msec	
			No crankshaft pulses received		Engine is Running OR Starter is engaged No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA P0340 P0341	2 failures out of 10 samples One sample per engine revolution	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position (CKP) Sensor A Performance	P0336	Determines if a performance fault exists with the crank position sensor signal	Time in which 10 or more crank re-synchronizations occur	< 10.0 seconds	Engine Air Flow Cam-based engine speed No DTC Active:	>= 3.0 grams/second > 450 RPM 5VoltReferenceB_FA P0335	Continuous every 250 msec	Type B, 2 Trips
			No crankshaft synchronization gap found	>= 0.4 seconds	Engine is Running Starter is not engaged No DTC Active:	5VoltReferenceB_FA	Continuous every 12.5 msec	
			Time since starter engaged without detecting crankshaft synchronization gap	>= 1.5 seconds	Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	= FALSE = FALSE = FALSE > 3.0 grams/second))	Continuous every 100 msec	
			Crank pulses received in one engine revolution OR Crank pulses received in one engine revolution	< 51 > 65	Engine is Running OR Starter is engaged No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA P0340 P0341	8 failures out of 10 samples One sample per engine revolution	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor A	P0340	Determines if a fault exists with the cam position bank 1 sensor A signal	Time since last camshaft position sensor pulse received	>= 5.5 seconds	Starter engaged AND (cam pulses being received	= FALSE = FALSE = FALSE > 3.0 grams/second)	Continuous every 100 msec	Type B, 2 Trips
			OR					
			Time that starter has been engaged without a camshaft sensor pulse	>= 4.0 seconds	OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow			
			Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Engine is running Starter is not engaged No DTC Active:			
No camshaft pulses received during first 24 MEDRES events (There are 24 MEDRES events per engine cycle		Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Continuous every MEDRES event				
The number of camshaft pulses received during 100 engine cycles	= 0	Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle				

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Camshaft Position (CMP) Sensor Performance Bank 1 Sensor A	P0341	Determines if a performance fault exists with the cam position bank 1 sensor A signal	The number of camshaft pulses received during first 24 MEDRES events is OR (There are 24 MEDRES events per engine cycle)	< 4 > 8	Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensorFA	Continuous every MEDRES event	Type B, 2 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensorFA	8 failures out of 10 samples Continuous every engine cycle	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #2 CIRCUIT - for single DTC implementati on only	P0352	Diagnoses Cylinder #2 Ignition Control (EST) output driver circuit for Open Circuit, Short- low, and Short-high faults.	<p>The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.</p> <p>Voltage low during driver high state (indicates short-to-ground)</p> <p>Voltage high during driver low state (indicates short- to-power)</p> <p>High impedance during driver high state (indicates open circuit)</p>	<p><u>Short to ground:</u> ≤ 100 Ω impedance between signal and controller ground</p> <p><u>Short to power:</u> ≤ 100 Ω impedance between signal and controller power</p> <p><u>Open Circuit:</u> ≥ 30 kΩ impedance between signal and controller ground</p>	<p>Engine running</p> <p>Ignition Voltage</p>	> 5.00 Volts	<p>50 Failures out of 63 Samples</p> <p>100 msec rate</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #3 CIRCUIT - for single DCT implementati on only	P0353	Diagnoses Cylinder #3 Ignition Control (EST) output driver circuit for Open Circuit, Short-Low, and Short-high faults.	<p>The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.</p> <p>Voltage low during driver high state (indicates short-to-ground)</p> <p>Voltage high during driver low state (indicates short-to-power)</p> <p>High impedance during driver high state (indicates open circuit)</p>	<p><u>Short to ground:</u> ≤ 100 Ω impedance between signal and controller ground</p> <p><u>Short to power:</u> ≤ 100 Ω impedance between signal and controller power</p> <p><u>Open Circuit:</u> ≥ 30 kΩ impedance between signal and controller ground</p>	<p>Engine running</p> <p>Ignition Voltage</p>	> 5.00 Volts	<p>50 Failures out of 63 Samples</p> <p>100 msec rate</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #4 CIRCUIT - for single DTC implementati on only	P0354	Diagnoses Cylinder #4 Ignition Control (EST) output driver circuit for Open Circuit, Short-low, and Short-high faults.	<p>The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.</p> <p>Voltage low during driver high state (indicates short-to-ground)</p> <p>Voltage high during driver low state (indicates short-to-power)</p> <p>High impedance during driver high state (indicates open circuit)</p>	<p><u>Short to ground:</u> ≤ 100 Ω impedance between signal and controller ground</p> <p><u>Short to power:</u> ≤ 100 Ω impedance between signal and controller power</p> <p><u>Open Circuit:</u> ≥ 30 kΩ impedance between signal and controller ground</p>	<p>Engine running</p> <p>Ignition Voltage</p>	> 5.00 Volts	<p>50 Failures out of 63 Samples</p> <p>100 msec rate</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #8 CIRCUIT - for single DTC implementati on only	P0358	Diagnoses Cylinder #8 Ignition Control (EST) output driver circuit for Open Circuit, Short-low, and Short-high faults.	<p>The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.</p> <p>Voltage low during driver high state (indicates short-to-ground)</p> <p>Voltage high during driver low state (indicates short-to-power)</p> <p>High impedance during driver high state (indicates open circuit)</p>	<p><u>Short to ground:</u> ≤ 100 Ω impedance between signal and controller ground</p> <p><u>Short to power:</u> ≤ 100 Ω impedance between signal and controller power</p> <p><u>Open Circuit:</u> ≥ 30 kΩ impedance between signal and controller ground</p>	<p>Engine running</p> <p>Ignition Voltage</p>	> 5.00 Volts	<p>50 Failures out of 63 Samples</p> <p>100 msec rate</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Catalyst System Low Efficiency Bank 1	P0420	<p>NOTE: The information below applies to applications that use the Decel Catalyst Monitor Algorithm</p> <p>Oxygen StorageThe catalyst washcoat contains Cerium Oxide. Cerium Oxide reacts with NO and O2 during lean A/F excursions to store the excess oxygen (I.e. Cerium Oxidation). During rich A/F excursions, Cerium Oxide reacts with CO and H2 to release this stored oxygen (I.e. Cerium Reduction). This is referred to as the Oxygen Storage Capacity, or OSC. CatMon's strategy is to "measure" the OSC of the catalyst through forced Rich (intrusive rich) and Lean (decel fuel cutoff) A/F excursions</p> <p>Normalized Ratio OSC Value Calculation Information and Definitions = 1. Raw OSC Calculation = (post cat O2 Resp time - pre cat O2 Resp time) 2. BestFailing OSC value from a calibration</p>	Normalized Ratio OSC Value (EWMA filtered)	< 0.35	<p>All enable criteria associated with P0420 can be found under P2270 - (O2 Sensor Signal Stuck Lean Bank 1 Sensor 2)</p> <p>Rapid Step Response (RSR) feature will initiate multiple tests:</p> <p>If the difference between current EWMA value and the current OSC Normalized Ratio value is</p> <p>and the current OSC Normalized Ratio value is</p> <p>Maximum number of RSR tests to detect failure when RSR is enabled.</p> <p>General Enable Criteria</p> <p>In addition to the p-codes listed under P2270, the following DTC's shall also not be set:</p>	<p>> 0.46</p> <p>< 0.10</p> <p>12</p> <p>O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA</p>	<p>1 test attempted per valid decel period</p> <p>Minimum of 1 test per trip</p> <p>Maximum of 8 tests per trip</p> <p>Frequency: Fueling Related : 12.5 ms</p> <p>OSC Measurements: 100 ms</p> <p>Temp Prediction: 12.5ms</p>	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>table (based on temp and exhaust gas flow) 3. WorstPassing OSC value (based on temp and exhaust gas flow)</p> <p>Normalized Ratio Calculation = (1-2) / (3-2)</p> <p>A Normalized Ratio of 1 essentially represents a good part and a ratio of 0 essentially represents a very bad part.</p> <p>Refer to the P0420_WorstPassing OSCTableB1 and P0420_BestFailingOSCTableB1 in the Supporting Tables tab for details</p> <p>The Catalyst Monitoring Test is completed during a decel fuel cutoff event. This fuel cutoff event occurs following a rich intrusive fueling event initiated by the O2 Sensor Signal Stuck Lean Bank 1 Sensor 2 test (P2270). Several conditions must be met in order to execute this test.</p> <p>These conditions and their related values are listed in the "Secondary</p>						

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Parameters" and "Enable Conditions" section of this document for P2270 (O2 Sensor Signal Stuck Lean Bank 1 Sensor 2)						

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Catalyst System Low Efficiency Bank 2	P0430	<p>Note: The information below applies to applications that use the Decel Catalyst Monitor Algorithm</p> <p>Oxygen StorageThe catalyst washcoat contains Cerium Oxide. Cerium Oxide reacts with NO and O2 during lean A/F excursions to store the excess oxygen (I.e. Cerium Oxidation). During rich A/F excursions, Cerium Oxide reacts with CO and H2 to release this stored oxygen (I.e. Cerium Reduction). This is referred to as the Oxygen Storage Capacity, or OSC. CatMon's strategy is to "measure" the OSC of the catalyst through forced Rich (intrusive rich) and Lean (decel fuel cutoff) A/F excursions</p> <p>Normalized Ratio OSC Value Calculation Information and Definitions =</p> <ol style="list-style-type: none"> Raw OSC Calculation = (post cat O2 Resp time - pre cat O2 Resp time) BestFailing OSC value from a calibration 	Normalized Ratio OSC Value (EWMA filtered)	< 0.35	<p>All enable criteria associated with P0430 can be found under P2272 - (O2 Sensor Signal Stuck Lean Bank 2 Sensor 2)</p> <p>Rapid Step Response (RSR) feature will initiate multiple tests:</p> <p>If the difference between current EWMA value and the current OSC Normalized Ratio value is</p> <p>and the current OSC Normalized Ratio value is</p> <p>Maximum number of RSR tests to detect failure when RSR is enabled.</p> <p>General Enable Criteria</p> <p>In addition to the p-codes listed under P2272, the following DTC's shall also not be set:</p>	<p>> 0.46</p> <p>< 0.10</p> <p>12</p> <p>O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA</p>	<p>1 test attempted per valid decel period</p> <p>Minimum of 1 test per trip</p> <p>Maximum of 8 tests per trip</p> <p>Frequency: Fueling Related : 12.5 ms</p> <p>OSC Measurements: 100 ms</p> <p>Temp Prediction: 12.5ms</p>	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>table (based on temp and exhaust gas flow) 3. WorstPassing OSC value (based on temp and exhaust gas flow)</p> <p>Normalized Ratio Calculation = (1-2) / (3-2)</p> <p>A Normalized Ratio of 1 essentially represents a good part and a ratio of 0 essentially represents a very bad part.</p> <p>Refer to the P0430_WorstPassing OSCTableB2 and P0430_BestFailingOSCTableB2 in the Supporting Tables tab for details</p> <p>The Catalyst Monitoring Test is completed during a decel fuel cutoff event. This fuel cutoff event occurs following a rich intrusive fueling event initiated by the O2 Sensor Signal Stuck Lean Bank 2 Sensor 2 test (P2272). Several conditions must be met in order to execute this test.</p> <p>These conditions and their related values are listed in the "Secondary</p>						

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Parameters" and "Enable Conditions" section of this document for P2272 (O2 Sensor Signal Stuck Lean Bank 2 Sensor 2)						

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>Must expire maximum value in Estimate of Ambient Temperature Valid Conditioning Time. Please see P0442: Estimate of Ambient Temperature Valid Conditioning Time Table in Supporting Tables.</p> <p>1. High Fuel Volatility</p> <p>During the volatility phase, pressure in the fuel tank is integrated vs. time. If the integrated pressure is then test aborts and unsuccessful attempts is incremented. This value equates to an average integrated fuel tank pressure > 1,245 Pa. Please see P0442: Volatility Time as a Function of Estimate of Ambient Temperature in Supporting Tables.</p> <p>OR</p> <p>2. Vacuum Refueling Detected</p> <p>See P0454 Fault Code for information on vacuum refueling algorithm.</p> <p>OR</p> <p>3. Fuel Level Refueling</p>	<p>< -5</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>Detected</p> <p>See P0464 Fault Code for information on fuel level refueling.</p> <p>OR</p> <p>4. Vacuum Out of Range and No Refueling</p> <p>See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for information on fuel level refueling.</p> <p>OR</p> <p>5. Vacuum Out of Range and Refueling Detected</p> <p>See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for information on fuel level refueling.</p> <p>OR</p> <p>6. Vent Valve Override Failed</p> <p>Device control using an off-board tool to control the vent solenoid, cannot exceed during the EONV test</p> <p>OR</p> <p>7. Key up during EONV test</p>	<p>0.50 seconds</p>		

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No active DTCs:	MAF_SensorFA ECT_Sensor_FA IAT_SensorFA VehicleSpeedSensor_FA IgnitionOffTimeValid AmbientAirDefault P0443 P0446 P0449 P0452 P0453 P0455 P0496		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission (EVAP) Canister Purge Solenoid Valve Circuit (ODM) (No ELCP - Conventional EVAP Diagnostic - For Single DTC Implementation Only)	P0443	Diagnoses the canister purge solenoid low side driver circuit for circuit faults	Voltage low during driver off state (indicates open circuit or short-to-ground) Voltage high during driver on state (indicates short to power)	Open circuit: ≥ 200 K Ω impedance between signal and controller ground Short to ground: ≤ 0.5 Ω impedance between signal and controller ground Short to power: ≤ 0.5 Ω impedance between signal and controller power	PT Relay Voltage	Voltage ≥ 11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission (EVAP) Vent System Performance (No ELCP - Conventional EVAP Diagnostic)	P0446	This DTC will determine if a restriction is present in the vent solenoid, vent filler, vent hose or EVAP canister. This test runs with normal purge and vent valve is open.	Vent Restriction Prep Test: Vented Vacuum for OR Vented Vacuum for Vent Restriction Test: Tank Vacuum for before Purge Volume After setting the DTC for the first time, 2 liters of fuel must be consumed before setting the DTC for the second time.	< -623 Pa 60 seconds > 1,245 Pa 60 seconds > 2,989 Pa 5 seconds ≥ 14 liters	Fuel Level System Voltage Startup IAT Startup ECT BARO No active DTCs:	10 % ≤ Percent ≤ 90 % 11 volts ≤ Voltage ≤ 32 volts 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C ≥ 70 kPa MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454	Once per Cold Start Time is dependent on driving conditions Maximum time before test abort is 1,000 seconds	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission (EVAP) Vent Solenoid Control Circuit (ODM) (No ELCP - Conventional EVAP Diagnostic - For Single DTC Implementation Only)	P0449	Diagnoses the vent solenoid low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit or short-to-ground) Voltage high during driver on state (indicates short to power) If the P0449 is active, an intrusive test is performed with the vent solenoid commanded closed for 15 seconds.	Open circuit: ≥ 200 K Ω impedance between signal and controller ground Short to ground: ≤ 0.5 Ω impedance between signal and controller ground Short to power: ≤ 0.5 Ω impedance between signal and controller power			20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Tank Pressure (FTP) Sensor Circuit Performance (No ELCP - Conventional EVAP Diagnostic)	P0451	The DTC will be set if the fuel tank vacuum sensor is out of range when it tries to re-zero prior to the phase-1 or phase-2 portions of the engine-off natural vacuum small leak test.	<p>The tank vacuum sensor voltage is compared to a window about the nominal sensor voltage offset (~1.5 volts)</p> <p>Upper voltage threshold (voltage addition above the nominal voltage)</p> <p>Lower voltage threshold (voltage subtraction below the nominal voltage)</p> <p>The difference between tank vacuum sensor voltage and the nominal offset voltage is then normalized against the appropriate threshold listed above to produce a ratio between 0.0 and 1.0. This normalized re-zero ratio is then filtered with a EWMA (with 0= perfect pass and 1=perfect fail).</p> <p>When EWMA is</p> <p>the DTC light is illuminated.</p> <p>The DTC light can be turned off if the EWMA is</p> <p>and stays below the EWMA fail threshold for 3 additional consecutive trips.</p>	<p>0.2 volts</p> <p>0.2 volts</p> <p>> 0.73 (EWMA Fail Threshold),</p> <p>≤ 0.40 (EWMA Re-Pass Threshold)</p>	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The number of times that it executes can range from zero to two per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.	Type A, 1 Trips EWMA Average run length: 6 Run length is 2 trips after code clear or non-volatile reset

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage (No ELCP - Conventional EVAP Diagnostic)	P0452	This DTC will detect a Fuel Tank Pressure (FTP) sensor signal that is too low out of range.	FTP sensor signal The normal operating range of the FTP sensor is 0.5 volts (~1245 Pa) to 4.5 volts (~3736 Pa).	< 0.15 volts (3.0 % of Vref or ~ 1,681 Pa)	Time delay after sensor power up for sensor warm-up is	0.10 seconds	640 failures out of 800 samples 12.5 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Tank Pressure (FTP) Sensor Circuit High Voltage (No ELCP - Conventional EVAP Diagnostic)	P0453	This DTC will detect a Fuel Tank Pressure (FTP) sensor signal that is too high out of range.	FTP sensor signal The normal operating range of the FTP sensor is 0.5 volts (~1245 Pa) to 4.5 volts (~ -3736 Pa).	> 4.85 volts (97 % of Vref or ~ -4,172 Pa)	Time delay after sensor power up for sensor warm-up is	0.10 seconds	640 failures out of 800 samples 12.5 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Tank Pressure (FTP) Sensor Circuit Intermittent (No ELCP - Conventional EVAP Diagnostic)	P0454	This DTC will detect intermittent tank vacuum sensor signals that would have caused the engine-off natural vacuum small leak test to abort due to an apparent re-fueling event.	If an abrupt change in tank vacuum is detected the engine-off natural vacuum test is aborted due to an apparent refueling event. Subsequent to the abort, a refueling rationality test is executed to confirm that a refueling event occurred. If a refueling is confirmed, then the test sample is considered passing. Otherwise, the sample is considered failing indicating an intermittent signal problem. An abrupt change is defined as a change in vacuum: in the span of 1.0 seconds. But in 12.5 msec. A refueling event is confirmed if the fuel level has a persistent change of for 30 seconds during a 600 second refueling rationality test.	> 112 Pa < 249 Pa > 10 %	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes and the canister vent solenoid is closed		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete. The test will report a failure if 2 out of 3 samples are failures. 12.5 ms / sample	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 1 Performance (For use on vehicles with a single fuel tank)	P0461	This DTC will detect a fuel sender stuck in range in the primary fuel tank.	Delta fuel volume change over an accumulated 87 miles.	< 3 liters	Engine Running No active DTCs:	VehicleSpeedSensor_FA	250 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 1 Circuit Low Voltage	P0462	This DTC will detect a fuel sender stuck out of range low in the primary fuel tank.	Fuel level Sender % of 5V range	< 10 %			100 failures out of 125 samples 100 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 1 Circuit High Voltage	P0463	This DTC will detect a fuel sender stuck out of range high in the primary fuel tank.	Fuel level Sender % of 5V range	> 60 %			100 failures out of 125 samples 100 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 1 Circuit Intermittent (No ELCP - Conventional EVAP Diagnostic)	P0464	This DTC will detect intermittent fuel level sensor signals that would have caused the engine-off natural vacuum small leak test to abort due to an apparent re-fueling event.	<p>If a change in fuel level is detected, the engine-off natural vacuum test is aborted due to an apparent refueling event. Subsequent to the abort, a refueling rationality test is executed to confirm that an actual refueling event occurred. If a refueling event is confirmed, then the test sample is considered passing. Otherwise, if a refueling event is not confirmed, then the test sample is considered failing which indicates an intermittent signal problem.</p> <p>An intermittent fuel level signal problem is defined as:</p> <p>The fuel level changes by and does not remain for 30 seconds during a 600 second refueling rationality test.</p>	> 10 % > 10 %	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		<p>This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete. The test will report a failure if 2 out of 3 samples are failures.</p> <p>100 ms / sample</p>	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission (EVAP) System Flow During Non- Purge (No ELCP - Conventional EVAP Diagnostic)	P0496	This DTC will determine if the purge solenoid is leaking to engine manifold vacuum. This test will run with the purge valve closed and the vent valve closed.	Tank Vacuum for Test time	> 2,491 Pa 5 seconds ≤ refer to P0496: Purge Valve Leak Test Engine Vacuum Test Time (Cold Start) as a Function of Fuel Level Table in Supporting Tables.	Fuel Level System Voltage BARO Startup IAT Startup ECT Engine Off Time No active DTCs:	10 % ≤ Percent ≤ 90 % 11 volts ≤ Voltage ≤ 32 volts ≥ 70 kPa 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C ≥ 28,800.0 seconds MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454	Once per cold start Cold start: max time is 1,000 seconds	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Oil Pressure (EOP) Sensor Performance	P0521	Determines if the Engine Oil Pressure (EOP) Sensor is stuck or biased in range	<p>Single Stage Oil Pump EOP Sensor Test with Engine Running</p> <p>If enabled:</p> <p><u>To pass a currently failing test:</u></p> <p>The filtered, weighted difference between measured EOP and predicted EOP (a function of engine speed and engine oil temp.):</p> <p><u>To fail a currently passing test:</u></p> <p>The filtered, weighted difference between measured EOP and predicted EOP (a function of engine speed and engine oil temp.):</p>	<p>< -50.0 kPa OR > 50.0 kPa</p> <p>> -47.0 kPa AND < 47.0 kPa</p>	<p>Diagnostic enabled/ disabled</p> <p>Oil Pressure Sensor In Use</p> <p>Quality or weighting factor values less than "1" indicate that we don't have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of Variance data. Regions where diagnosis is possible have a quality or weighting factor value that is a function of engine speed, engine oil temperature, predicted oil pressure, and engine load stability.</p> <p>(RPM_Weighting_Factor * Oil_Temp_Weighting_Factor * Eng_Load_Stability_Weighting_Factor * Eng_Oil_Pred_Weighting_Factor) with a first order filter coefficient of 0.01</p> <p>(See Details on P0521 Supporting Tables Tab) RPM_Weighting_Factor RPM_Weighting_Factor_X_Axis Oil_Temp_Weighting_Fa</p>	<p>Enabled</p> <p>Present</p> <p>>= 0.30 weighting</p>	Performed every 100 msec	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					ctor Oil_Temp_Weighting_Factor_Axis Eng_Load_Stability_Weighting_Factor Eng_Load_Stability_Weighting_Factor_Axis Eng_Oil_Pred_Weighting_Factor Eng_Oil_Pred_Weighting_Factor_Axis No active DTC's	Fault bundles: EngOilPressureSensorCkt FA CrankSensorFA ECT_Sensor_FA MAF_SensorFA IAT_SensorFA		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Oil Pressure (EOP) Sensor Circuit Low Voltage	P0522	Determines if the Engine Oil Pressure (EOP) Sensor circuit voltage is too low	(Engine Oil Pressure Sensor Circuit Voltage) / 5 Volts	< 5.00 percent	Engine Speed Enable Engine Speed Disable Sensor Present Diagnostic enabled/ disabled	> 400 rpm < 350 rpm Present Enabled	50 failures out of 63 samples Performed every 6.25 msec	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Oil Pressure (EOP) Sensor Circuit High Voltage	P0523	Determines if the Engine Oil Pressure (EOP) Sensor circuit voltage is too high	(Engine Oil Pressure Sensor Circuit Voltage) / 5 Volts	> 85.00 percent	Sensor Present Diagnostic enabled/ disabled	Present Enabled	204 failures out of 255 samples Performed every 6.25 msec	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Multi-Function Switch Circuit	P0564	Detect when cruise control multi-function switch circuit (analog) voltage is in an illegal range	Cruise Control analog circuit voltage must be in an "illegal range" or "between ranges" for greater than a calibratable period of time for cruise switch states that are received over serial data		CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 0.500 seconds	MIL: Type C, No MIL

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Resume Circuit	P0567	Detects a failure of the cruise resume switch in a continuously applied state	Cruise Control Resume switch remains applied for greater than a calibratable period of time for architecture where cruise switch states are received over serial data		CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 90.000 seconds	MIL: Type C, No MIL

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Set Circuit	P0568	Detects a failure of the cruise set switch in a continuously applied state	Cruise Control Set switch remains applied for greater than a calibratable period of time for architecture where cruise switch states are received over serial data		CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 90.000 seconds	MIL: Type C, No MIL

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Input Circuit	P0575	Detects rolling count or protection value errors in Cruise Control Switch Status serial data signal	If x of y rolling count / protection value faults occur, disable cruise for duration of fault		Cruise Control Switch Serial Data Error Diagnostic Enable	1.00	10 / 16 counts	MIL: Type C, No MIL

14 OBDG12 ECM Summary Tables

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

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Not Programmed	P0602	This DTC will be stored if the PCM is a service PCM that has not been programmed.	Output state invalid		PCM State	= crank or run PCM is identified through calibration as a Service PCM	Diagnostic runs at powerup and once per second continuously after that	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up does not match checksum at power-down				Diagnostic runs at powerup Diagnostic reports a fault if 1 failure occurs	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
ECM RAM Failure	P0604	Indicates that the ECM has detected a RAM fault	Indicates that the primary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	Type A, 1 Trips
			Indicates that the primary processor is unable to correctly read data from or write data to cached RAM. Detects data read does not match data written >=	254 counts		Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)		
			Indicates that the primary processor is unable to correctly read data from or write data to TPU RAM. Detects data read does not match data written >=	5 counts		Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)		
			Indicates that the primary processor detects a mismatch between the data and dual data is found during RAM updates. Detects a mismatch in data and dual data updates >	0.47088 s		When dual store updates occur.		

14 OBDG12 ECM Summary Tables

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

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal ECM Processor Integrity Fault	P0606	Indicates that the ECM has detected an internal processor integrity fault	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 >= 6.41 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 ECM 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, 20 / 200 counts intermittent or 0.1875 s continuous; 0.4750 s continuous @ initialization. 12.5 ms /count in the ECM 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	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			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 ECM 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_ConfigRegTes tEnbl d == 1 Value of KePISD_b_ConfigRegTes tEnbl 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_SO H_FltEnbl d == 1 Value of KePISD_b_ConfigRegTes tEnbl d is: 1. (If 0, this test is disabled) time from initialization >= 0.4875 seconds	50 ms	
			memory and complement memory do not agree				0.19 seconds	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Software background task first pass time to complete exceeds			Run/Crank voltage > 6.41	360.000 seconds	
			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 d == 1 Value of KePISD_b_ConfigRegTestEnbl d 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 >	0.4950		KePISD_b_A2D_CnvrtrTestEnbl == 1 Value of KePISD_b_A2D_CnvrtrTestEnbl is: 1. (If 0, this test is disabled)	5 / 10 counts or 0.150 seconds continuous; 50 ms/count in the ECM 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	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	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			controller initialization. Counter >=					
			Checks for ECC (error 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 >=	3 (results in MIL), 5 (results in MIL and remedial action)		KeMEMD_b_RAM_ECC_CktTestEnbl == 1 Value of KeMEMD_b_RAM_ECC_CktTestEnbl is: 1. (If 0, this test is disabled)	variable, 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(Loop Time). See supporting tables: Program Sequence Watch Enable f(Loop Time) (If 0, this Loop Time test is disabled)	Fail Table, f(Loop Time). See supporting tables: PSW Sequence Fail f(Loop Time) / Sample Table, f(Loop Time)See supporting tables: PSW Sequence Sample f(Loop Time) counts 50 ms/count in	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							the ECM main processor	
			MAIN processor determines a seed has not changed within a specified time period within the 50ms task.	Previous seed value equals current seed value.		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: Last Seed Timeout f (Loop Time)	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Relay Control Circuit Low Voltage	P0628	Diagnoses the fuel pump relay control high side driver circuit for circuit faults	Voltage low during driver on state (indicates short to ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Run/Crank Voltage Engine Speed	Voltage ≥ 11 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module EEPROM Error	P062F	Indicates that the NVM Error flag has not been cleared	The next write to NVM will not succeed or the assembly calibration integrity check failed.		Ignition State	= unlock/accessory, run, or crank	1 test failure Diagnostic runs once at powerup	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
VIN Not Programmed or Mismatched - Engine Control Module (ECM)	P0630	This DTC checks that the VIN is correctly written	At least one of the programmed VIN digits	= 00 or FF	OBD Manufacturer Enable Counter	= 0	250 ms / test Continuous	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #1 Circuit	P0641	Detects a continuous or intermittent short on the 5 volt reference circuit #1	ECM Vref1 < or ECM Vref1 > or the difference between ECM filtered Vref1 and Vref1 >	4.8750 5.1250 0.0495		Run/Crank voltage > 6.41	19 / 39 counts or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Malfunction Indicator Lamp (MIL) Control Circuit (ODM) Open - For 3 DTC implementation only	P0650	Diagnoses the malfunction indicator lamp control low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Run/Crank Voltage Remote Vehicle Start is not active	Voltage ≥ 11 volts	20 failures out of 25 samples 250 ms / sample	Type B, No MIL NO MIL Note: In certain controllers P263A may also set (MIL Control Short to Ground)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #2 Circuit	P0651	Detects a continuous or intermittent short on the 5 volt reference circuit #2	ECM Vref2 < or ECM Vref2 > or the difference between ECM filtered Vref2 and Vref2 >	4.8750 5.1250 0.0495		Run/Crank voltage > 6.41	19 / 39 counts or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Control (ODM) Open - For 3 DTC implementati on only	P0685	Diagnoses the powertrain relay control low side driver circuit for circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit: ≥ 200 K Ω ohms impedance between signal and controller ground	Run/Crank Voltage	Voltage ≥ 11 volts	8.00 failures out of 10.00 samples 250 ms / sample	Type B, 2 Trips Note: In certain controlle rs P0686 may also set (Powertr ain Relay Control Short to Ground).

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Control (ODM) Low	P0686	Diagnoses the powertrain relay control low side driver circuit for circuit faults	Voltage low during driver off state (indicates short- to-ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Run/Crank Voltage	Voltage ≥ 11 volts	8.00 failures out of 10.00 samples 250 ms / sample	Type B, 2 Trips Note: In certain controlle rs P0685 may also set (Powertr ain Relay Control Open Circuit).

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Control (ODM) High	P0687	Diagnoses the powertrain relay control low side driver circuit for circuit faults	Voltage high during driver on state (indicates short to power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Run/Crank Voltage	Voltage ≥ 11 volts	8.00 failures out of 10.00 samples 250 ms / sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Feedback Circuit High	P0690	This DTC is a check to determine if the Powertrain relay is functioning properly.	Powertrain Relay Voltage	>= 4.0 volts will increment the fail counter	Powertrain relay commanded "OFF" No active DTCs:	>= 2.00 seconds PowertrainRelayStateOn_ FA	50.00 failures out of 63.00 samples 100ms / Sample	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on the 5 volt reference circuit #3	ECM Vref3 < or ECM Vref3 > or the difference between ECM filtered Vref3 and Vref3 >	4.8750 5.1250 0.0495		Run/Crank voltage > 6.41	19 / 39 counts or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #4 Circuit	P06A3	Detects a continuous or intermittent short on the 5 volt reference circuit #4	ECM Vref4 < or ECM Vref4 > or the difference between ECM filtered Vref4 and Vref4 >	4.8750 5.1250 0.0495		Run/Crank voltage > 6.41	19 / 39 counts or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module Knock Sensor Processor 1 Performance	P06B6	This diagnostic checks for a fault with the internal test circuit used only for the '20 kHz' method of the Open Circuit Diagnostic	FFT Diagnostic Output	> OpenTestCktThrshMin and < OpenTestCktThrshMax See Supporting Tables	Diagnostic Enabled? Engine Run Time Engine Speed Cumulative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow	Yes ≥ 2.0 seconds > 400 RPM and < 3,500 RPM ≥ 200 Revs ≥ 10 mg/cylinder and ≤ 2,000 mg/cylinder	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0100 Updated each engine event	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module Knock Sensor Processor 2 Performance	P06B7	This diagnostic checks for a fault with the internal test circuit used only for the '20 kHz' method of the Open Circuit Diagnostic	FFT Diagnostic Output	> OpenTestCktThrshMin and < OpenTestCktThrshMax See Supporting Tables	Diagnostic Enabled? Engine Run Time Engine Speed Cumulative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow	Yes ≥ 2.0 seconds > 400 RPM and < 3,500 RPM ≥ 200 Revs ≥ 10 mg/cylinder and ≤ 2,000 mg/cylinder	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0100 Updated each engine event	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Control Module (TCM) Requested MIL Illumination	P0700	Monitors the TCM MIL request line to determine when the TCM has detected a MIL illuminating fault.	Transmission Emissions-Related DTC set			Time since power-up ≥ 3 seconds	Continuous	Type A, No MIL

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Inlet Airflow System Performance (naturally aspirated)	P1101	Determines if there are multiple air induction problems affecting airflow and/or manifold pressure.	Filtered Throttle Model Error AND (ABS(Measured Flow – Modeled Air Flow) Filtered OR ABS(Measured MAP – MAP Model 1) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	<= 300 kPa*(g/s) > 20 grams/sec > 20.0 kPa) > 20.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together)	>= 465 RPM <= 4,600 RPM > -7 Deg C < 125 Deg C > -20 Deg C < 100 Deg C >= 0.50 Filtered Throttle Model Error multiplied by TPS Residual Weight Factor based on RPM Modeled Air Flow Error multiplied by MAF Residual Weight Factor based on RPM and MAF Residual Weight Factor Based on MAF Est MAP Model 1 Error multiplied by MAP1 Residual Weight Factor based on RPM MAP Model 2 Error multiplied by MAP2 Residual Weight Factor based on RPM See Residual Weight Factor tables. MAP_SensorCircuitFA EGRValvePerformance_FA A MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No Pending DTCs:	IAT_SensorFA EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Metal Over temperature Active	P1258	The objective of the algorithm is to protect the engine in the event of engine metal overtemperature, mainly due to loss of coolant	Engine Coolant For a period	>= 129 °C >= 10 seconds	Engine Run Time If feature was active and it set the coolant sensor fault then feature will be enabled on coolant sensor fault pending on the next trip.	>= 10 Seconds	Fault present for >= 0 seconds	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
ABS Rough Road malfunction	P1380	This diagnostic detects if the ABS controller is indicating a fault, and misfire is present. When this occurs, misfire will continue to run. If Misfire P0300 then sets while the ABS fault is present, P1380 will set as a diagnostic aid.	GMLan Message: "Wheel Sensor Rough Road Magnitude Validity"	= FALSE	Vehicle Speed Engine Speed Engine LoadRunCrankActive Active DTC	VSS ≥ 5 mph rpm < 8,192 load < 60 = TRUE P0300, MIL Request	40 failures out of 80 samples 250 ms /sample Continuous	Type C, No MIL "Special Type C"

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Steady State Actuation Fault	P1516	Detect an inability to maintain a steady state throttle position	The absolute difference between desired and indicated throttle position is >	2.00 percent		Run/Crank voltage > 6.41 Ignition voltage failure is false (P1682) TPS minimum learn is not active and Throttle is being Controlled Throttle is considered in a steadystate condition when the desired throttle position over a 12.5 ms period is < 0.25 percent for a settling time period > 4.00 s	0.49 ms	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Ignition Voltage Correlation	P1682	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the Powertrain Relay Ignition Voltage	Run/Crank – PT Relay Ignition >	3.00 Volts		Powertrain commanded on AND (Run/Crank voltage > Table, f(IAT). See supporting tables: PT Relay Pull-in Run/Crank Voltage f(IAT) OR PT Relay Ignition voltage > 5.50) AND Run/Crank voltage > 5.50 .	240 / 480 counts or 0.1750 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module Redundant Memory Performance	P16F3	<p>Detect Processor Calculation faults due to RAM corruptions, ALU failures and ROM failures</p> <p>For all of the following cases: If the individual diagnostic threshold is equal to 2048 ms, this individual case is not applicable. If any of the following cases are X out of Y diagnostics and the fail (x) is greater than the sample (Y), this individual case is also not applicable.</p>	Desired Throttle Area calculated does not equal its redundant calculation	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	Type A, 1 Trips
			Equivalence Ratio torque compensation exceeds threshold	-100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Absolute difference between Equivalence Ratio torque compensation and its dual store out of bounds given by threshold	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of Accessory torque and its redundant calculation is out of bounds given by threshold range	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Absolute difference of Filtered Air-per-cylinder and its redundant calculation is out of bounds given by threshold range	118.03 mg	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference between the previous Final Advance and the current Final Advance not Adjusted for Equivalence Ratio is out of bounds given by threshold range	8.09 degrees		Engine speed >0rpm	Up/down timer 158 ms continuous, 0.5 down time multiplier	
			Torque Learn offset is out of bounds given by threshold range	High Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				Low Threshold 0.00 Nm			multiplier	
			One step ahead calculation of air-per-cylinder and two step ahead is greater than threshold	80.00 mg		Engine speed > 515 rpm	Up/down timer 458 ms continuous, 0.5 down time multiplier	
			Difference between Unmanaged Spark and PACS Spark is greater than threshold	8.10 degrees	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Commanded Predicted Engine Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							multiplier	
			Zero pedal axle torque is out of bounds given by threshold range	High Threshold 1,503.00 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Creep Coast Axle Torque is out of bounds given by threshold range	High Threshold 1,503.00 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			Absolute difference of Friction torque and its redundant calculation is out of bounds given by threshold range	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							multiplier	
			Arbitrated Air-Per-Cylinder filter coefficient is out of bounds given by threshold range	High Threshold 1.000 Low Threshold 0.074	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Launch spark is active but the launch spark redundant path indicates it should not be active	N/A		Engine speed < 7,900.00 or 8,000.00 rpm (hysteresis pair)	Up/down timer 158 ms continuous, 0.5 down time multiplier	
			Rate limited vehicle speed and its dual store do not equal	N/A		Time since first CAN message with vehicle speed >= 0.500 sec	10/20 counts; 25.0msec/count	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Preload Throttle Area and its dual store do not equal	N/A	Ignition State	Accessory, run or crank AFM apps only	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			Commanded engine torque due to fast actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Commanded engine torque due to slow actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			TOS to wheel speed conversion factor is out of bounds given by threshold	High Threshold: 1.10	Ignition State	Accessory, run or crank	255 / 6 counts; 25.0msec/count	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			range	T/C Range Hi 0.10 T/C Range Lo Low Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo				
			TOS to wheel speed conversion factor and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	255 / 6 counts; 25.0msec/count	
			Cylinders active greater than commanded	2 cylinders		Engine run flag = TRUE > 2.00s Number of cylinder events since engine run > 24	Up/down timer 158ms continuous, 0.5 down time multiplier	
						No fuel injector faults		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						active		
			Transfer case neutral request from four wheel drive logic does not match with operating conditions	N/A	Ignition State	Accessory, run or crank Transfer case range valid and not over-ridden FWD Apps only	32 / 0 counts; 25.0msec/count	
			Transfer case neutral and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	8 / 16 counts; 25.0msec/count	
			Driver progression mode and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Predicted torque for uncorrected zero pedal determination is greater than calculated limit.	Table, f(Engine, Oil Temp). See supporting tables + 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Engine Predicted Request Without Motor is greater than its redundant calculation plus threshold	99.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Engine Immediate Request Without Motor is greater than its redundant calculation plus threshold	99.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Positive Torque Offset is greater than its redundant calculation plus threshold OR Positive Torque Offset is less than its redundant calculation minus threshold	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Commanded Predicted Engine Request is greater than its redundant calculation plus threshold	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

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

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				0.00 Nm			0.5 down time multiplier	
			Cylinder Spark Delta Correction exceeds the absolute difference as compared to Unadjusted Cylinder Spark Delta	8.10 degrees	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			1. Cylinder Torque Offset exceeds step size threshold OR 2. Sum of Cylinder Torque Offset exceeds sum threshold	1. 100.00 Nm 2. 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine Capacity Minimum Immediate Without Motor is greater than its dual store plus threshold	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Engine Capacity Minimum Engine Off is greater than threshold	0 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Engine Capacity Minimum Engine Immediate Without Motor is greater than threshold	0 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Commanded Immediate Engine Request is greater than its redundant calculation plus threshold	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			Engine Speed Lores Intake Firing (event based) calculation does not equal its redundant calculation	N/A		Engine speed greater than 0rpm	Up/down timer 158 ms continuous, 0.5 down time multiplier	
			Engine Speed Lores Intake Firing timing (event	N/A		Engine speed greater than 0rpm	Up/down timer 158	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			based) calculation does not equal its redundant calculation				ms continuous, 0.5 down time multiplier	
			Idle speed control calculated predicted minimum torque request exceeds calculated torque limit	Table, f(Oil Temp, RPM). See supporting tables: Speed Control External Load f(Oil Temp, RPM) + 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	Table, f(Oil Temp, RPM). See supporting tables: Speed Control External Load f(Oil Temp, RPM) + 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Difference between Driver Requested Immediate	1,503.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2.048	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Torque primary path and its secondary exceeds threshold				ms continuous, 0.5 down time multiplier	
			Driver Immediate Request is less than its redundant calculation minus threshold	1,503.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Commanded Immediate Request is greater than its redundant calculation plus threshold OR Commanded Immediate Request is less than its redundant calculation minus threshold	1,503.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Commanded Immediate Response Type is set to Inactive	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			Difference between Cruise Axle Torque Arbitrated Request and Cruise Axle Torque Request exceeds threshold	187.88 Nm		Cruise has been engaged for more than 4.00 seconds	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			Desired engine torque request greater than redundant calculation plus threshold	99.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine min capacity above threshold	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 75 ms continuous, 0.5 down time multiplier	
			No fast unmanaged retarded spark above the applied spark plus the threshold	Table, f(RPM,APC). See supporting tables: Delta Spark Threshold f (RPM,APC)		Engine speed greater than 0rpm	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of adjustment factor based on temperature and its dual store above threshold	2.76 m/s	Ignition State	Accessory, run or crank	Up/down timer 104 ms continuous, 0.5 down time multiplier	
			1. Absolute difference of redundant calculated engine speed above threshold	500 RPM		Engine speed greater than 0 RPM	Up/down timer 158 ms continuous, 0.5	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							down time multiplier	
			After throttle blade pressure and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Speed Control's Predicted Torque Request and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Engine oil temperature and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 250 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Desired throttle position greater than redundant calculation plus threshold	8.41 percent	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of the rate limited pre-throttle pressure and its redundant calculation greater than threshold	0.06 kpa	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Throttle desired torque above desired torque plus threshold	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Desired filtered throttle torque exceeds the threshold plus the higher of desired throttle torque or modeled throttle torque	100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							multiplier	
			Torque feedback proportional term is out of allowable range or its dual store copy does not match	High Threshold 50.00 Nm Low Threshold -50.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Torque feedback integral term magnitude or rate of change is out of allowable range or its dual store copy do not match	High Threshold 93.75 Nm Low Threshold -100.00 Nm Rate of change threshold	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				6.25 Nm/loop				
			Difference of Final Torque feedback proportional plus integral term and its redundant calculation is out of bounds given by threshold range	High Threshold 100.00 Nm Low Threshold - 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Difference of torque desired throttle area and its redundant calculation is out of bounds given by threshold range	High Threshold 0.50 % Low Threshold - 0.50 %	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Difference of torque model coefficients and its redundant calculation is out of bounds given by threshold range	High Threshold 0.0001300 Low Threshold - 0.0001300	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Difference of base friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 100.00 Nm Low Threshold - 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Accessory drive friction torque is out of bounds given by threshold range	High Threshold 100.00 Nm Low Threshold	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				0.00 Nm				
			AC friction torque is greater than commanded by AC control software or less than threshold limit	High Threshold 55.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Difference of Oil temperature delta friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 100.00 Nm Low Threshold - 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			Generator friction torque is out of bounds given by threshold range	High Threshold 100.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Supercharger friction torque is out of bounds given by threshold range	High Threshold 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				Low Threshold 0.00 Nm				
			Filtered Torque error magnitude or its increase rate of change is out of allowable range or its dual store copy do not match	High Threshold 100.00 Nm Low Threshold -100.00 Nm Rate of change threshold 6.25 Nm/loop		Engine speed >0rpm MAF, MAP and Baro DTCs are false	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Torque error compensation is out of bounds given by threshold range	High Threshold 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				Low Threshold 0.00 Nm			multiplier	
			Delta Torque Baro compensation is out of bounds given by threshold range	High Threshold 10.92 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			1. Difference of reserve torque value and its redundant calculation exceed threshold OR 2. Reserve request does not agree with operating conditions or Difference of final predicted torque and its redundant calculation	1. 99.00 Nm 2. N/A 3. 99.00 Nm 4. 99.00		1. & 2.: Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 100.00 Nm	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			exceed threshold OR 3. Rate of change of reserve torque exceeds threshold, increasing direction only OR 4. Reserve engine torque above allowable capacity threshold	Nm	3. & 4.: Ignition State	3. & 4.: Accessory, run or crank		
			Engine Vacuum and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of the calculated Intake Manifold Pressure during engine event versus during time event is greater than threshold	Table, f(Desired Engine Torque). See supporting tables: Delta MAP Threshold f(Desired Engine Torque)		Engine speed >0rpm	Up/down timer 158 ms continuous, 0.5 down time multiplier	
			Min. Axle Torque Capacity is greater than threshold	0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							ms continuous, 0.5 down time multiplier	
			Driver Predicted Request is greater than its redundant calculation plus threshold OR Driver Predicted Request is less than its redundant calculation minus threshold	1,503.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Cold Delta Friction Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Predicted torque for zero pedal determination is greater than calculated limit.	Table, f(Oil Temp, RPM). See supporting tables: Speed Control External Load f(Oil Temp, RPM) + 100.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Commanded Predicted Axle Torque and its dual store do not match	1 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Steady State Estimated Engine Torque and its dual store are not equal	N/A		AFM not changing from Active to Inactive and preload torque not changing and one loop after React command Engine speed >0rpm	Up/down timer 1,988 ms continuous, 0.5 down time multiplier	
			Difference of Weighting factor for number of cylinders fueled and its	0.26		Engine run flag = TRUE > 10.00	Up/down timer 175 ms continuous,	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			redundant calculation is above threshold				0.5 down time multiplier	
			Difference of minimum spark advance limit and its redundant calculation is out of bounds given by threshold range	8.09 degrees	Ignition State	Accessory, run or crank	Up/down timer 158 ms continuous, 0.5 down time multiplier	
			Difference of commanded spark advance and adjusted delivered is out of bounds given by threshold range	8.09 degrees		Engine speed >0rpm	Up/down timer 158 ms continuous, 0.5 down time multiplier	
			Absolute difference between Estimated Engine Torque and its dual store are above a threshold	100.00 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Absolute difference between Estimated Engine Torque without reductions due to torque control and its dual store are above a threshold	100.00 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Difference of desired spark advance for managed torque and its redundant calculation is out of bounds given by threshold range	8.09 degrees		Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 100.00 Nm	Up/down timer 458 ms continuous, 0.5 down time multiplier	
			Absolute difference of Engine Capacity Minimum Running Immediate Brake Torque Excluding Cylinder Sensitivity and its redundant calculation is out of bounds given by threshold range	100.00 Nm		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multiplier	

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			One step ahead calculation of air-per-cylinder greater than two step ahead calculation by threshold for time	Threshold: Dynamically calculated based on current engine conditions Fault Pending Threshold: 100 ms		Engine speed > 515 rpm	Up/down timer 458 ms continuous, 0.5 down time multiplier	
			Rate limited cruise axle torque request and its dual store do not match within a threshold	187.88 Nm	Ignition State	Accessory, run or crank	Up/down timer 163 ms continuous, 0.5 down time multiplier	
			1. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range	1. 5.00 % 2. N/A 3. N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			OR 2. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its dual store do not equal OR 3. Absolute difference of Calculated accelerator pedal position and its dual store do not equal					
			Commanded axle torque is greater than its redundant calculation by threshold	1,503.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Commanded axle torque is less than its redundant calculation by threshold	-65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous,	

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							0.5 down time multiplier	
			Preload timer and its redundant calculation do not equal	N/A	Ignition State	Accessory, run or crank AFM apps only	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			AC friction torque is greater than commanded by AC control software	55.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			Engine Speed Lores Intake Firing (time based) calculation does not equal its redundant calculation	N/A		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of the calculated spark offset for	8.09 degrees		Engine speed >0rpm	Up/down timer 158	

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			equivalence ratio and its redundant cacluation is greater than a threshold				ms continuous, 0.5 down time multiplier	
			Transmission Torque Request cacluations do not equal their dual stores	N/A		Run or Crank = TRUE > 0.50 s	6 / 10 counts; 25.0msec/count	
			Absolute difference of the predicted motor torque ACS and its redundant cacluation is greater than a threshold	0.01 Nm			Up/down timer 2,048 ms continuous, 0.5 down time multiplier	
			Absolute difference of maximum throttle area and its redundant cacluation is greater than a threshold	15 mm2			Up/down timer 104 ms continuous, 0.5 down time multiplier	
			Absolute difference of Desired TIAP and its redundant cacluation is greater than a threshold	25.00 kPa			Up/down timer 175 ms continuous, 0.5 down time multiplier	

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Post Catalyst Fuel Trim System Low Limit Bank 1 (Too Rich)	P2096	Determines if the post catalyst O2 sensor based fuel control system has utilized all or most of its low limit authority, indicating a rich emissions/exhaust gas condition. Note: If the post catalyst O2 voltage is too rich, the post catalyst O2 integral offset control is decreased. This results in lean bias fuel control in an attempt to correct the rich condition. A perfectly balanced control system (no rich or lean bias required) is represented by an integral offset value of "0" and a post catalyst O2 sensor that is within its optimal operating range (neither rich nor lean). An integral offset value < 0 is indicative of the control system reacting to a rich post catalyst O2 sensor. If the failure is such that the control system utilizes all or most of its available authority, then P2096 will set.	Rich Fail counter High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 18% for >= 5.0 seconds. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 15% for >= 20.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 300 counts per 375 sample counts Note: Counters increment at a rate of 10 per second when enable conditions are met. If the fail count threshold is reached, a fail is reported and the diagnostic will not report again until the next trip. If the sample count threshold is reached before a fail is reported, a pass is reported, the counters are reset to 0, and evaluation starts again.	The diagnostic is enabled during: Deceleration Idle Cruise Light Acceleration Heavy Acceleration Ambient Air Pressure Engine AirFlow Intake Manifold Pressure Induction Air Temperature Start-up Coolant Temp. PTO Intrusive diag. fuel control Long Term Secondary Fuel Trim Enabled (see "Long Term Secondary Fuel Trim Enable Criteria" in Supporting Tables) High Vapor Conditions No Fault Active for:	No No Yes Yes Yes >= 70 kPa >= 0.0 g/s <= 10,000.0 >= 0 kPa <= 200 >= -20 deg. C <= 45 >= -20 deg. C Not Active Not Active Not Present AmbientAirDefault AIR_System FA Ethanol Composition Sensor FA ECT_Sensor_FA EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorFA CamSensorAnyLocationFA EvapEmissionSystem_FA EvapFlowDuringNonPurge_FA FuelTankPressureSnrCkt_FA	Frequency: Continuous Monitoring in 100ms loop. Counters increment when enable conditions are met. When sample count threshold is reached or fail threshold is reached, counters are reset to 0 and start over.	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						EvapPurgeSolenoidCircuit_FA EvapSmallLeak_FA EvapVentSolenoidCircuit_FA FuelInjectorCircuit_FA MAF_SensorFA MAF_SensorTFTKO MAP_SensorFA MAP_EngineVacuumStatus EngineMisfireDetected_FA A/F Imbalance Bank1 O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA The above general enable conditions must be true for: Minimum accumulated counts in each cell required before counters will increment for that cell: Deceleration 300 Idle 300 Cruise 300 Light Acceleration 300 Heavy Acceleration 300 (Note: A value in any of the above operating "cells" that is an order of magnitude (or more) higher than other cells is an indication that the diagnostic is not capable of diagnosing in that cell). For the cells identified as	> 0.0 seconds	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					<p>enabled (i.e. those containing a "Yes" at the beginning of the Enable Conditions column), the fail counter will increment if the sample counter increments AND Post oxygen sensor control integral offset (in mV) is Deceleration Idle Cruise Light Acceleration Heavy Acceleration AND Post O2 Voltage is Deceleration Idle Cruise Light Acceleration Heavy Acceleration</p> <p>(Note: A value in any of the above operating "cells" that is greater than 900mV is an indication that the diagnostic is not capable of diagnosing in that cell).</p>	<p><= -140 (control min.= -150) -140 (control min.= -150) -390 (control min.= -400) -390 (control min.= -400) -390 (control min.= -400) > 800 mV 800 mV 780 mV 780 mV 780 mV</p>		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Post Catalyst Fuel Trim System High Limit Bank 1 (Too Lean)	P2097	Determines if the post catalyst O2 sensor based fuel control system has utilized all or most of its high limit authority, indicating a lean emissions/exhaust gas condition. Note: If the post catalyst O2 voltage is too lean, the post catalyst O2 integral offset control is increased. This results in rich bias fuel control in an attempt to correct the lean condition. A perfectly balanced control system (no rich or lean bias required) is represented by an integral offset value of "0" and a post catalyst O2 sensor that is within its optimal operating range (neither rich nor lean). An integral offset value > 0 is indicative of the control system reacting to a lean post catalyst O2 sensor. If the failure is such that the control system utilizes all or most of its available authority, then P2097 will set.	Lean Fail counter High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 18% for >= 5.0 seconds. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 15% for >= 20.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 300 counts per 375 sample counts Note: Counters increment at a rate of 10 per second when enable conditions are met. If the fail count threshold is reached, a fail is reported and the diagnostic will not report again until the next trip. If the sample count threshold is reached before a fail is reported, a pass is reported, the counters are reset to 0, and evaluation starts again.	Same as P2096 except for the following: For the cells identified as enabled (i.e. those containing a "Yes" at the beginning of the Enable Conditions for P2096), the fail counter will increment if the sample counter increments AND Post oxygen sensor control integral offset (in mV) is Deceleration Idle Cruise Light Acceleration Heavy Acceleration AND Post O2 Voltage is Deceleration Idle Cruise Light Acceleration Heavy Acceleration (Note: A value in any of the above operating "cells" that is less than 100mV is an indication that the diagnostic is not capable of diagnosing in that cell).	>= 130 (control max.= 150) 130 (control max.= 150) 380 (control max.= 400) 380 (control max.= 400) 380 (control max.= 400) < 660 mV 660 mV 660 mV 660 mV 660 mV	Frequency: Continuous Monitoring in 100ms loop. Counters increment when enable conditions are met. When sample count threshold is reached or fail threshold is reached, counters are reset to 0 and start over.	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Post Catalyst Fuel Trim System Low Limit Bank 2 (Too Rich)	P2098	<p>Determines if the post catalyst O2 sensor based fuel control system has reached it's low limit authority, indicating a rich emissions/exhaust gas condition.</p> <p>Note: If the post catalyst O2 voltage is too rich, the post catalyst O2 integral offset control is decreased. This results in lean bias fuel control in an attempt to correct the rich post O2 voltage. Determines if the post catalyst O2 sensor based fuel control system has utilized all or most of it's low limit authority, indicating a rich emissions/exhaust gas condition.</p> <p>Note: If the post catalyst O2 voltage is too rich, the post catalyst O2 integral offset control is decreased. This results in lean bias fuel control in an attempt to correct the rich condition. A perfectly balanced control system (no rich or lean bias required) is represented by an integral offset value of</p>	<p>Rich Fail counter</p> <p>High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is $\geq 18\%$ for ≥ 5.0 seconds.</p> <p>Diagnosis resumes if the purge valve is closed OR the percent vapor is $\leq 15\%$ for ≥ 20.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.</p>	<p>≥ 300 counts per 375 sample counts</p> <p>Note: Counters increment at a rate of 10 per second when enable conditions are met. If the fail count threshold is reached, a fail is reported and the diagnostic will not report again until the next trip. If the sample count threshold is reached before a fail is reported, a pass is reported, the counters are reset to 0, and evaluation starts again.</p>	<p>Same as P2096 except for the following:</p> <p>Bank1 Fault Active criteria are replaced by the equivalent Bank2 Fault Active criteria.</p> <p>The diagnostic is enabled during:</p> <p>Deceleration Idle Cruise Light Acceleration Heavy Acceleration</p> <p>Minimum accumulated counts in each cell required before counters will increment for that cell:</p> <p>Deceleration Idle Cruise Light Acceleration Heavy Acceleration</p> <p>(Note: A value in any of the above operating "cells" that is an order of magnitude (or more) higher than other cells is an indication that the diagnostic is not capable of diagnosing in that cell).</p> <p>For the cells identified as enabled (i.e. those containing a "Yes" at the beginning of the Enable Conditions column), the fail counter will increment</p>	<p>No No Yes Yes Yes</p> <p>300 300 300 300 300</p>	<p>Frequency: Continuous Monitoring in 100ms loop.</p> <p>Counters increment when enable conditions are met. When sample count threshold is reached or fail threshold is reached, counters are reset to 0 and start over.</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		<p>"0" and a post catalyst O2 sensor that is within it's optimal operating range (neither rich nor lean). An integral offset value < 0 is indicative of the control system reacting to a rich post catalyst O2 sensor. If the failure is such that the control system utilizes all or most of its available authority, then P2098 will set.</p>			<p>if the sample counter increments AND Post oxygen sensor control integral offset is Deceleration Idle Cruise Light Acceleration Heavy Acceleration AND Post O2 Voltage is Deceleration Idle Cruise Light Acceleration Heavy Acceleration</p> <p>(Note: A value in any of the above operating "cells" that is greater than 900mV is an indication that the diagnostic is not capable of diagnosing in that cell).</p>	<p><= -140 (control min.= -150) -140 (control min.= -150) -390 (control min.= -400) -390 (control min.= -400) -390 (control min.= -400) > 800 mV 800 mV 780 mV 780 mV 780 mV</p>		

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Post Catalyst Fuel Trim System High Limit Bank 2 (Too Lean)	P2099	Determines if the post catalyst O2 sensor based fuel control system has utilized all or most of its high limit authority, indicating a lean emissions/exhaust gas condition. Note: If the post catalyst O2 voltage is too lean, the post catalyst O2 integral offset control is increased. This results in rich bias fuel control in an attempt to correct the lean condition. A perfectly balanced control system (no rich or lean bias required) is represented by an integral offset value of "0" and a post catalyst O2 sensor that is within its optimal operating range (neither rich nor lean). An integral offset value > 0 is indicative of the control system reacting to a lean post catalyst O2 sensor. If the failure is such that the control system utilizes all or most of its available authority, then P2099 will set.	Lean Fail counter High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 18% for >= 5.0 seconds. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 15% for >= 20.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 300 counts per 375 sample counts Note: Counters increment at a rate of 10 per second when enable conditions are met. If the fail count threshold is reached, a fail is reported and the diagnostic will not report again until the next trip. If the sample count threshold is reached before a fail is reported, a pass is reported, the counters are reset to 0, and evaluation starts again.	Same as P2098 except for the following: Bank1 Fault Active criteria are replaced by the equivalent Bank2 Fault Active criteria. For the cells identified as enabled (i.e. those containing a "Yes" at the beginning of the Enable Conditions column for P2098), the fail counter will increment if the sample counter increments AND Post oxygen sensor control integral offset is Deceleration Idle Cruise Light Acceleration Heavy Acceleration AND Post O2 Voltage is Deceleration Idle Cruise Light Acceleration Heavy Acceleration (Note: A value in any of the above operating "cells" that is less than 100mV is an indication that the diagnostic is not capable of diagnosing in that cell).	>= 130 (control max.= 150) 130 (control max.= 150) 380 (control max.= 400) 380 (control max.= 400) 380 (control max.= 400) < 660 mV 660 mV 660 mV 660 mV 660 mV	Frequency: Continuous Monitoring in 100ms loop. Counters increment when enable conditions are met. When sample count threshold is reached or fail threshold is reached, counters are reset to 0 and start over.	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Throttle Actuator Position Performance	P2101	1) Detect a throttle positioning error2) Throttle control is driving the throttle in the incorrect direction3) Throttle control exceeds the reduced power limit	Difference between measured throttle position and modeled throttle position >	8.41 percent	TPS minimum learn is not active and Throttle is being Controlled and (Engine Running or Ignition Voltage > or Ignition Voltage >)	Run/Crank voltage > 6.41 Ignition voltage failure is false (P1682) TPS minimum learn is not active and Throttle is being Controlled AND ((Engine Running AND Ignition Voltage > 5.50) OR Ignition Voltage > 11.00)	15 counts; 12.5 ms/count in the primary processor	Type A, 1 Trips
			OR					
			Difference between modeled throttle position and measured throttle position >	8.41 percent				
			Throttle Position >	39.26 percent		Powertrain Relay voltage > 6.41 TPS minimum learn is active	11 counts; 12.5 ms/count in the primary processor	
			Throttle Position >	38.26 percent		Powertrain Relay voltage > 6.41 Reduced Power is True	11 counts; 12.5 ms/count in the primary processor	

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 1 Lo	P2122	Detect a continuous or intermittent short or open in the APP sensor #1 on Main processor	APP1 Voltage <	0.4625		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	19 / 39 counts or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 1 Hi	P2123	Detect a continuous or intermittent short or open in the APP sensor #1 on Main processor	APP1 Voltage >	4.7500		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	19 / 39 counts or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 2 Lo	P2127	Detect a continuous or intermittent short or open in the APP sensor #2 on Main processor	APP2 Voltage <	0.3250		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P0697)	19 / 39 counts or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 2 Hi	P2128	Detect a continuous or intermittent short or open in the APP sensor #2 on Main processor	APP2 Voltage >	2.6000		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P0697)	19 / 39 counts or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Throttle Position (TP) Sensor 1-2 Correlation	P2135	Detects a continuous or intermittent correlation fault between TPS sensors #1 and #2 on Main processor	Difference between TPS1 displaced and TPS2 displaced >	6.999 % offset at min. throttle position with a linear threshold to 9.673 % at max. throttle position		Run/Crank voltage > 6.41 No TPS sensor faults (P0122, P0123, P0222, P0223) No 5V reference error or fault for # 4 5V reference circuit (P06A3)	79 / 159 counts or 58 counts continuous; 3.125 ms/count in the main processor	Type A, 1 Trips
			Difference between (normalized min TPS1) and (normalized min TPS2) >	5.000 % Vref		Run/Crank voltage > 6.41 No TPS sensor faults (P0122, P0123, P0222, P0223) No 5V reference error or fault for # 4 5V reference circuit (P06A3)	79 / 159 counts or 58 counts continuous; 3.125 ms/count in the main processor	

14 OBDG12 ECM Summary Tables

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

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Minimum Throttle Position Not Learned	P2176	TP sensors were not in the minimum learn window after multiple attempts to learn the minimum.	During TPS min learn on the Main processor, TPS Voltage > AND Number of learn attempts >	0.9350 10 counts		Run/Crank voltage > 6.41 TPS minimum learn is active	2.0 secs	Type A, 1 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling System Performance	P2181	This DTC detects thermostat malfunction (i.e. stuck open)	<p>This diagnostic can be calibrated to fail in <u>one</u> of two methods based on the following calibration. This application has been calibrated as a Type 0 .</p> <p><u>Type 0 - Airflow Method:</u> Engine Coolant Temp (ECT) is \leq commanded temperature minus 11 Deg C and normalized ratio is \leq than 1.75 . When above is present for more than 5 seconds, fail counts start. == Ratio Definition:=== Current temp difference between ECT and RCT minus PwrUp difference divided by total airgrams. Note: Minimum total airgrams is 500.0 grams.</p> <p><u>Type 1 - Energy Method:</u> Engine Coolant Temp (ECT) is \leq commanded temperature minus 11 Deg C and normalized ratio is \leq than 0.01 . When above is present for more than 5 seconds, fail counts start. == Ratio Definition:=== Current temp difference between ECT and RCT minus PwrUp difference divided by predicted energy.</p>		<p>No Active DTC's</p> <p>Engine not run time</p> <p>Engine run time</p> <p>Fuel Condition ECT at Power Up IAT min T-Stat Heater duty cycle commanded</p> <p>Type 0: Airflow range to accumulate</p> <p>Type 1: Minimum energy to enable</p>	<p>MAF_SensorFA IAT_SensorFA THMR_RCT_Sensor_Ckt_FA THMR_ECT_Sensor_Ckt_FA</p> <p>$\geq 1,800$ seconds</p> <p>$90 \leq \text{Time} \leq 1,370$ seconds</p> <p>Ethanol $\leq 87\%$ $-40.0 \leq \text{ECT} \leq 70.0$ °C -7 °C \leq IAT ≤ 55 °C.</p> <p>$\leq 0\%$</p> <p>$17.0 \leq \text{Airflow} \leq 450.0$ gps</p> <p>10.0 kJ</p>	<p>30 failures out of 90 samples</p> <p>1 sec/ sample</p> <p>Once per ignition key cycle</p>	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Post fuel cell (Decel) Crankshaft Torque EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp Fuel State ===== All of the above met for at least 0.0 seconds, and then check the following Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled) Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled) ===== All of the above met for at least 2.0 seconds, and then the Force Cat Rich intrusive stage is requested. ===== During Stuck Lean test the following must stay TRUE or the test will abort: 0.95 ≤ Commanded Fuel EQR ≤ 1.10	= enabled < 1,000.0 Nm = not active = not active ≥ 80.0 sec 600 ≤ °C ≤ 900 = DFCO possible ===== 1,100 ≤ RPM ≤ 2,500 1,050 ≤ RPM ≤ 2,650 40.4 ≤ MPH ≤ 82.0 36.0 ≤ MPH ≤ 87.0		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Power Take Off EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp Fuel State DTC's Passed ===== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	= not active = not active = not active ≥ 80.0 sec 600 ≤ °C ≤ 900 DFCO possible = P2270 (and P2272 if applicable) = P013E (and P014A if applicable) = P013A (and P013C if applicable) =====		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Post fuel cell (Decel) Crankshaft Torque EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp Fuel State ===== All of the above met for at least 0.0 seconds, and then check the following Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled) Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled) ===== All of the above met for at least 2.0 seconds, and then the Force Cat Rich intrusive stage is requested. ===== During Stuck Lean test the following must stay TRUE or the test will abort: 0.95 ≤ Commanded Fuel EQR ≤ 1.10	= enabled < 1,000.0 Nm = not active = not active ≥ 80.0 sec 600 ≤ °C ≤ 900 = DFCS possible ===== 1,100 ≤ RPM ≤ 2,500 1,050 ≤ RPM ≤ 2,650 40.4 ≤ MPH ≤ 82.0 36.0 ≤ MPH ≤ 87.0 =====		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Power Take Off EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp Fuel State DTC's Passed ===== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	= not active = not active = not active ≥ 80.0 sec 600 ≤ °C ≤ 900 = DFCO possible = P2270 (and P2272 if applicable) = P013E (and P014A if applicable) = P013A (and P013C if applicable) =====		

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Control Torque Request Circuit	P2544	Determines if the torque request from the TCM is valid	Protect error - Serial Communication message - (\$199 - PTEI3) OR Rolling count error - Serial Communication message (\$199 - PPEI3) rolling count value OR Range Error - Serial Communication message - (\$199 - PTEI3) TCM Requested Torque Increase OR Multi-transition error - Trans torque intervention type request change	Message <> two's complement of message Message <> previous message rolling count value + one > 450 Nm Requested torque intervention type toggles from not increasing request to increasing request	Diagnostic enabled/ disabled Power Mode Ignition Voltage Engine Running Run/Crank Active No Serial communication loss to TCM (U0101)	Enabled = Run > 6.41 volts = True > 0.50 Sec No loss of communication	>= 16 failures Performed on every received message >= 6 Rolling count errors out of 10 samples. Performed on every received message >= 6 range errors out of 10 samples. Performed on every received message >= 3 multi-transitions out of 5 samples. Performed every 200 msec	Type B, 2 Trips

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Malfunction Indicator Lamp (MIL) Control Circuit (ODM) Low	P263A	Diagnoses the malfunction indicator lamp control low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Run/Crank Voltage Remote Vehicle Start is not active	Voltage ≥ 11 volts	20 failures out of 25 samples 250 ms / sample	Type B, No MIL NO MIL Note: In certain controllers P0650 may also set (MIL Control Open Circuit)

14 OBDG12 ECM Summary Tables

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Serial Number Not Programmed or Incompatible	P264F	This DTC checks that the engine serial number is correctly written	At least one of the programmed engine serial number digits	=0xFF	OBD Manufacturer Enable Counter	= 0	250 ms / test Continuous	Type A, 1 Trips

Closed Loop Enable Clarification: Calibration values are in the Supporting Tables

Engine run time greater than

KtFSTA_t_ClosedLoopAutostart (HYBRID ONLY)

AutoStart Coolant	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
Close Loop Enable Time	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11

and

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
Close Loop Enable Time	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11

and pre converter O2 sensor voltage less than

KfFULC_U_O2_SensorReadyThresh

Lo

Voltage < XXXXmilliVolts

for

KcFULC_O2_SensorReadyEvents

Time (events * 12.5 milliseconds) > XXXXevents

and

COSC (Converter Oxygen Storage Control) not enabled

and

Consumed AirFuel Ratio is stoichiometry i.e. not in component protection

and

POPD or Catalyst Diagnostic not intrusive

and

Turbo Scavenging Mode not enabled

and

All cylinders whose valves are active also have their injectors enabled

and

O2S_Bank_1_TFTKO, O2S_Bank_2_TFTKO, FuelInjectorCircuit_FA and CyInderDeacDriverTFTKO = False

Long Term FT Enable Criteria

Closed Loop Enable Clarification: Calibration values are in the Supporting Tables

Closed Loop Enable and
Coolant greater than
KfFCLL_T_AdaptiveLoCoolant

Coolant > XXXXCelcius

or less than
KfFCLL_T_AdaptiveHiCoolant

Coolant < XXXXCelcius

and
KtFCLL_p_AdaptiveLowMAP_Limit

Barometric Pressure	X1	X2	X3	X4	X5	X6	X7	X8	X9
Manifold Air Pressure	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9

and
TPS_ThrottleAuthorityDefaulted =
False

and
Flex Fuel Estimate Algorithm is not active

and
Excessive fuel vapors boiling off from the engine oil algorithm (BOFR) is not
enabled

and
Catalyst or EVAP large leak test not
intrusive

Secondary Fuel Trim Enable
Criteria

Closed Loop Enable and
KfFCLP_U_O2ReadyThrshLo

Voltage < XXXXmilliVolts

for
KcFCLP_Cnt_O2RdyCyclesThrsh

Time (events * 12.5 milliseconds) > XXXXevents

Long Term Secondary Fuel Trim
Enable Criteria

KtFCLP_t_PostIntglDisableTime

14 OBDG12 ECM Supporting Tables

Closed Loop Enable Clarification: Calibration values are in the Supporting Tables

Start-Up Coolant	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
Post Integral Enable Time	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11

Plus

KtFCLP_t_PostIntglRampInTime

Start-Up Coolant	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
Post Integral Ramp In Time	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11

and

KeFCLP_T_IntegrationCatalystMax

Modeled Catalyst Temperature < XXXXCelcius

and

KeFCLP_T_IntegrationCatalystMin

Modeled Catalyst Temperature > XXXXCelcius

and

PO2S_Bank_1_Snsr_2_FA and

PO2S_Bank_2_Snsr_2_FA = False

and

(KeFCLP_Pct_CatAccuSlphrPostDsbl

Modeled converter sulfur percent < XXXX Percent

and

Post Integral < KaFCLP_U_SlphrintglOfst_Thrsh)

X axis: Post O2 Sensor

Y axis: Post O2 Mode

Z: Post Integral threshold

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Multiple DTC Use_Green Sensor Delay Criteria - Airflow

Description: This Calibration is the airflow (in gps) above which the green airflow is accumulated to expire the condition.

Notes: Used for: P0133, P013A, P013B, P013C, P013D, P013E, P013F, P014A, P014B, P0153, P015A, P015B, P015C, P015D, P1133, P1153, P2270, P2271, P2272 and P2273. The specific diagnostic (from summary table) will not be enabled until the next ignition cycle after the airflow criteria below (by sensor location) has been met:

y/x	1
1	22

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Multiple DTC Use_Green Sensor Delay Criteria - Limit

Description: This Calibration is the accumulated airflow (in grams) limit above which the green condition is expired

Notes: Used for: P0133, P013A, P013B, P013C, P013D, P013E, P013F, P014A, P014B, P0153, P015A, P015B, P015C, P015D, P1133, P1153, P2270, P2271, P2272 and P2273. Note: This feature is only enabled when the vehicle is new and cannot be enabled in service

y/x	CiOXYR_O2_Bank1_Sensor1	CiOXYR_O2_Bank1_Sensor2	CiOXYR_O2_Bank2_Sensor1	CiOXYR_O2_Bank2_Sensor2
1	120,000	120,000	120,000	120,000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0068_Delta MAF Threshold f(TPS)

Description: Table of delta MAF values as a function of desired throttle position. The output of this table provides a delta MAF that if the measured minus the estimated MAF exceeds, is considered a fail.

Notes: P0068, KtTPSD_dm_MAF_DesThrDelt

y/x	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	100.00
1.00	15.43	19.72	25.32	26.87	36.79	45.05	255.00	255.00	255.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0068_Delta MAP Threshold f(TPS)

Description: Table of delta MAP values as a function of desired throttle position. The output of this table provides a delta MAP that if the measured minus the estimated MAP exceeds, is considered a fail.

Notes: P0068, KtTPSD_p_MAP_DesThrDelt

y/x	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	100.00
1.00	21.45	22.81	22.56	18.69	19.59	19.23	100.00	100.00	100.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0068_Maximum MAF f(RPM)

Description: Table of maximum MAF values vs. engine speed. This is the maximum MAF the engine can see under all ambient conditions.

Notes: P0068, KtTPSD_dm_MaxMAF_VsRPM

y/x	600.00	1,400.00	2,200.00	3,000.00	3,800.00	4,600.00	5,400.00	6,200.00	7,000.00
1.00	25.00	60.00	100.00	140.00	180.00	220.00	250.00	280.00	300.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0068_Maximum MAF f(Volts)

Description: Table of maximum MAF values vs. system voltage. The output of the air meter is clamped to lower values as system voltage drops off.

Notes: P0068, KtTPSD_dm_MaxMAF_VsVoltage

y/x	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00
1.00	0.00	18.00	40.00	75.00	135.00	250.00	500.00	500.00	500.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P00B6_Fail if power up ECT exceeds RCT by these values

Description: KtTHMD_T_DCRD_FastFailTempDiff

Notes: X axis is IAT Temperature at Power up (° C), Z axis is the Fast Failure temp difference (° C) The 17 X-axis breakpoints for the table below are (L to R) -40, -28, -16, -4, 8, 20, 32, 44, 56, 68, 80, 92, 104, 116, 128, 140 and 152. Note: Remove for applications with single coolant sensor

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	141	152
1	80	80	80	60	60	40	40	30	30	30	30	30	30	30	30	30	30

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P012B_P0236_P1101 MAF Residual Weight Factor based on MAF Est

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAF Residual Weight Factor based on MAF Est

Notes:

y/x	0	50	70	73	76	79	82	85	89	95	100	110	150	170	200	280	350
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P012B_P0236_P1101 MAF Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAF Residual Weight Factor based on RPM

Notes:

y/x	0	500	850	1,200	1,550	1,900	2,250	2,600	2,950	3,300	3,650	4,000	4,350	4,700	5,050	5,400	5,750
1	1.000	0.940	0.900	0.870	0.840	0.800	0.770	0.760	0.750	0.745	0.740	0.700	0.660	0.630	0.588	0.580	0.580

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P012B_P0236_P1101 MAP1 Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAP1 Residual Weight Factor based on RPM

Notes:

y/x	0	500	850	1,200	1,550	1,900	2,250	2,600	2,950	3,300	3,650	4,000	4,350	4,700	5,050	5,400	5,750
1	0.780	0.790	0.790	0.790	0.807	0.825	0.837	0.850	0.855	0.855	0.850	0.850	0.850	0.850	0.850	0.850	0.850

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P012B_P0236_P1101 TPS Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 TPS Residual Weight Factor based on RPM

Notes:

y/x	0	500	850	1,200	1,550	1,900	2,250	2,600	2,950	3,300	3,650	4,000	4,350	4,700	5,050	5,400	5,750
1	1.000	0.500	0.500	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.850	0.850	0.850	0.850	1.000	1.000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P0236_P1101 TIAP Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P0236_P1101 TIAP Residual Weight Factor based on RPM

Notes:

y/x	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max Air Flow

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max MAP

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Offset

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Offset

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min Air Flow

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min MAP

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Offset

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Offset

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0116_Fail if power up ECT exceeds IAT by these values

Description: KtECTD_T_HSC_FastFailTempDiff

Notes: X axis is IAT Temperature at Power up (° C), Z axis is the Fast Failure temp difference (° C)

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	80	80	80	60	60	40	40	30	30	30	30	30	30	30	30	30	30

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0128_Maximum Accumulated Time for IAT and Start-up ECT conditions (Alternate Test)

Description: KtTHMD_t_WrmUpTempTimeLimTest1

Notes: Z axis is the accumulated time failure threshold (seconds), X axis is ECT Temperature at Power up (° C) The 11 X-axis breakpoints for the table below are (L to R) -40, -28, -16, -4, 8, 20, 32, 44, 56, 68 and 80. Note: Remove for applications with single coolant sensor (Old time based version)

y/x	-40	-28	-16	-4	8	20	32	44	56	69	80
1	870	785	700	615	530	445	360	275	190	105	20

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0128_Maximum Accumulated Time for IAT and Start-up ECT conditions (Primary Test)

Description: KtTHMD_t_WrmUpTempTimeLimTest0

Notes: Z axis is the accumulated time failure threshold (seconds), X axis is ECT Temperature at Power up (° C) The 11 X-axis breakpoints for the table below are (L to R) -40, -28, -16, -4, 8, 20, 32, 44, 56, 68 and 80. Note: Remove for applications with single coolant sensor (Old time based version)

y/x	-40	-28	-16	-4	8	20	32	44	56	69	80
1	950	865	780	695	610	525	440	355	270	185	100

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0133_KnEOSD_t_ST_LRC_LimRS1

Description: KnEOSD_t_ST_LRC_LimRS1. X Table Axis (in sec) for P0133, L2R Reponse time breakpoints for table

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.090	0.100	0.120	0.140	0.160	0.180	0.200	0.210	2.000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0133_KnEOSD_t_ST_RLC_LimRS1

Description: KnEOSD_t_ST_RLC_LimRS1. Y Table Axis (in sec) for P0133, R2L Reponse time breakpoints for table

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.130	0.140	0.150	0.160	0.170	0.180	2.000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0133_O2S Slow Response Bank 1 Sensor 1 "Pass/Fail Threshold table"

Description: KaEOSD_x_ST_ResponseLimRS1[x][y]

Notes: X axis is Lean to Rich response time (in sec), Please see the table below named "KnEOSD_t_ST_LRC_LimRS1" for the 17 X axis table breakpoints. Y axis is Rich to Lean response time (sec), Please see the cal table below named "KnEOSD_t_ST_RLC_LimRS1" for the 17 Y axis table breakpoints. Z axis is the pass/fail result, Note: If the cell contains a "0" then the fault is indicated, if it contains a "1" a fault is not indicated.

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
3	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
4	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
5	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
6	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
10	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
11	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
12	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0
13	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0
14	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0
15	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0153_KnEOSD_t_ST_LRC_LimRS2

Description: KnEOSD_t_ST_LRC_LimRS2. X Table Axis (in sec) for P0153, L2R Reponse time breakpoints for table

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.090	0.100	0.120	0.140	0.160	0.180	0.200	0.210	2.000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0153_KnEOSD_t_ST_RLC_LimRS2

Description: KnEOSD_t_ST_RLC_LimRS2. Y Table Axis (in sec) for P0153, R2L Reponse time breakpoints for table

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.130	0.140	0.150	0.160	0.170	0.180	2.000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0153_O2S Slow Response Bank 2 Sensor 1 "Pass/Fail Threshold table"

Description: KaEOSD_x_ST_ResponseLimRS2[x][y]

Notes: X axis is Lean to Rich response time (in sec), Please see the table below named "KnEOSD_t_ST_LRC_LimRS2" for the 17 X axis table breakpoints. Y axis is Rich to Lean response time (sec), Please see the cal table below named "KnEOSD_t_ST_RLC_LimRS2" for the 17 Y axis table breakpoints. Z axis is the pass/fail result, Note: If the cell contains a "0" then the fault is indicated, if it contains a "1" a fault is not indicated.

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
3	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
4	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
5	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
6	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
10	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
11	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
12	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0
13	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0
14	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0
15	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage

Description: Identifies which Long Term Fuel Trim Cell I.D.s are used for diagnosis. Only cells identified as "CeFADD_e_NonSelectedCell" are not used for diagnosis.

Notes: DTCs: P0171, P0172, P0174, P0175; Calibration Name: KaFADD_e_SelectCellSet; Axis is Long Term Fuel Trim Cell I.D.

P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 1

y/x	CeFADR_e_Cell00_PurgOnAirMode 5	CeFADR_e_Cell01_PurgOnAirMode 4	CeFADR_e_Cell02_PurgOnAirMode 3	CeFADR_e_Cell03_PurgOnAirMode 2
1	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell

P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 2

y/x	CeFADR_e_Cell04_PurgOnAirMode 1	CeFADR_e_Cell05_PurgOnAirMode 0	CeFADR_e_Cell06_PurgOnIdle	CeFADR_e_Cell07_PurgOnDecel
1	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell

P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 3

y/x	CeFADR_e_Cell08_PurgOffAirMode 5	CeFADR_e_Cell09_PurgOffAirMode 4	CeFADR_e_Cell10_PurgOffAirMode 3	CeFADR_e_Cell11_PurgOffAirMode 2
1	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell

P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 4

y/x	CeFADR_e_Cell12_PurgOffAirMode 1	CeFADR_e_Cell13_PurgOffAirMode 0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
1	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0324_P0326_P0331_AbnormalNoise_CylsEnabled

Description: Specifies which cylinders will be used for the Abnormal Noise portion of the performance diagnostics (1 = cylinder used, 0 = cylinder not used)

Notes: Used for P0324, P0326 and P0331. Cal name: KaKNKD_b_PerfAbnIncludeCyl. x-axis = Cylinder number in firing order (i.e. Cyl 0 = first cylinder in firing order, Cyl 1 = second cylinder in firing order....)

A cal value = 1 specifies the cylinder is used for the Abnormal Noise diagnostic. A cal value = 0 specifies the cylinder is not used. Only the first four values in the table are relevant for a four-cylinder engine and only the first six values in the table are relevant for a six-cylinder engine.

Typically, all cylinders are used. Cylinders are only excluded if the signal from that cylinder is weak and there is no separation between normal and faulted conditions (can occur if the sensor location results in poor signal-to-noise ratio for a given cylinder).

y/x	0	1	2	3	4	5	6	7
1	1	1	1	1	1	1	1	1

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0324_P0326_P0331_AbnormalNoise_Threshold

Description: Fail threshold for the Knock Performance Abnormal Noise Diagnostic

Notes: Used for P0324, P0326 and P0331. Cal Name: KtKNKD_k_PerfAbnLimitLo. X-axis = Engine Speed (RPM). Diagnostic fails when VaKNKD_k_PerfCylAbnFiltIntensity < KtKNKD_k_PerfAbnLimitLo

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	0.290	0.290	0.290	0.290	0.290	0.380	0.440	0.520	0.590	0.540	0.630	0.660	0.660	0.660	0.660	0.660	0.660

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0325_P0330_OpenCktThrshMax (20 kHz)

Description: Knock Open Circuit Diagnostic Maximum Threshold when using the 20 kHz method (see "OpenMethod" description)

Notes: Used for P0325 and P0330. Cal name: KtKNKD_k_OpenMax20K. x-axis = Engine Speed (RPM).

Diagnostic fails when the filtered diagnostic output is between the OpenCktThrshMin and OpenCktThrshMax:
i.e.: KtKNKD_k_OpenMin20K < VaKNKD_k_OpenFiltIntensity < KtKNKD_k_OpenMax20K.

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	43.1348	42.6289	42.0293	41.0059	40.6895	35.9766	33.5293	30.9180	31.5039	26.7090	22.8516	20.3320	18.0234	15.9980	14.3320	13.0996	12.3770

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0325_P0330_OpenCktThrshMax (Normal Noise)

Description: Knock Open Circuit Diagnostic Minimum Threshold when using the Normal Noise method (see "OpenMethod" description): When using the Normal Noise method (see "OpenMethod" description).

Notes: Used for P0325 and P0330. Cal name: KtKNKD_k_OpenMaxNN. x-axis = Engine Speed (RPM)

Diagnostic fails when the filtered diagnostic output is between the OpenCktThrshMin and OpenCktThrshMax:
i.e.: KtKNKD_k_OpenMinNN < VaKNKD_k_OpenFilIntensity < KtKNKD_k_OpenMaxNN.

y/x	2,700	2,900	3,000	3,250	3,500	3,750	4,000	4,250	4,500	4,750	5,000	5,500	6,000	6,500	7,000	7,500	8,500
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0325_P0330_OpenCktThrshMin (20 kHz)

Description: Knock Open Circuit Diagnostic Minimum Threshold when using the 20 kHz method (see "OpenMethod" description)

Notes: Used for P0325 and P0330. Cal name: KtKNKD_k_OpenMin20K. x-axis = Engine Speed (RPM)

Diagnostic fails when the filtered diagnostic output is between the OpenCktThrshMin and OpenCktThrshMax:
 i.e.: KtKNKD_k_OpenMin20K < VaKNKD_k_OpenFiltIntensity < KtKNKD_k_OpenMax20K.

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	12.7773	12.8477	12.5645	12.1777	12.1191	10.0938	8.9297	9.0586	9.4688	7.9785	6.4531	6.4492	6.4492	6.4492	6.4492	6.4492	6.4492

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0325_P0330_OpenCktThrshMin (Normal Noise)

Description: Knock Open Circuit Diagnostic Minimum Threshold when using the Normal Noise method (see "OpenMethod" description): When using the Normal Noise method (see "OpenMethod" description).

Notes: Used for P0325 and P0330. Cal name: KtKNKD_k_OpenMinNN. x-axis = Engine Speed (RPM)

Diagnostic fails when the filtered diagnostic output is between the OpenCktThrshMin and OpenCktThrshMax:

i.e.: $KtKNKD_k_OpenMinNN < VaKNKD_k_OpenFilIntensity < KtKNKD_k_OpenMaxNN$.

y/x	2,700	2,900	3,000	3,250	3,500	3,750	4,000	4,250	4,500	4,750	5,000	5,500	6,000	6,500	7,000	7,500	8,500
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0325_P0330_OpenMethod

Description: Defines which Knock Open Circuit Diagnostic method to use.

Notes: Used for P0325 and P0330. Cal name: KtKNKD_e_OpenMethod. x-axis = Engine Speed Index, 500 to 8500 (RPM) by 500 rpm increments.

Selects 1 of 3 available methods: "20kHz Method", "Normal Noise Method," or "Disabled." The mode chosen dictates which set of threshold tables are used. Typically, either: A) the 20 kHz Method is used for all RPM or B) the 20 kHz Method is used for low/medium RPM and the Normal Noise Method is used for high RPM.

P0325_P0330_OpenMethod - Part 1

y/x	0	1	2	3	4
1	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz

P0325_P0330_OpenMethod - Part 2

y/x	5	6	7	8	9
1	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz

P0325_P0330_OpenMethod - Part 3

y/x	10	11	12	13	14
1	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz

P0325_P0330_OpenMethod - Part 4

y/x	15	16			
1	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz			

14 OBDG12 ECM Supporting Tables

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.

Notes: P0606, KaPISD_t_LastSeedTimeout[x]

y/x	CePISR_e_6p25msSeq	CePISR_e_12p5msSeq	CePISR_e_25msSeq	CePISR_e_LORES_C
1	0.175	0.175	0.175	409.594

14 OBDG12 ECM Supporting Tables

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

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

Notes: P0606, KaPISD_b_ProgSeqWatchEnbl

y/x	CePISR_e_6p25msSeq	CePISR_e_12p5msSeq	CePISR_e_25msSeq	CePISR_e_LORES_C
1	1	1	1	1

14 OBDG12 ECM Supporting Tables

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

Description: Fail threshold for PSW per operating loop.

Notes: P0606, KaPISD_Cnt_SequenceFail[x]

y/x	CePISR_e_6p25msSeq	CePISR_e_12p5msSeq	CePISR_e_25msSeq	CePISR_e_LORES_C
1	3	3	3	5

14 OBDG12 ECM Supporting Tables

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

Description: Sample threshold for PSW per operating loop.

Notes: P0606, KaPISD_Cnt_SequenceSmp[x]

y/x	CePISR_e_6p25msSeq	CePISR_e_12p5msSeq	CePISR_e_25msSeq	CePISR_e_LORES_C
1	4	4	4	4

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P16F3_Delta MAP Threshold f(Desired Engine Torque)

Description: Engine Sync based and Time based delta pressure threshold above which Torque Security error is reported.

Notes: P16F3, KtMAPI_p_ES_TB_MAP_DeltaThresh

y/x	0.00	50.00	100.00	150.00	200.00	300.00
1.00	18.69	18.69	18.69	18.69	18.69	18.69

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P16F3_Delta Spark Threshold f(RPM,APC)

Description: Threshold for determining when the difference between commanded spark and applied spark exceeds the torque security requirement. It is a function of engine rpm and APC.

Notes: P16F3, KtSPRK_phi_DeltTorqueScrtAdv

y/x	500.00	980.74	1,461.48	1,942.23	2,422.97	2,903.71	3,384.45	3,865.20	4,345.94	4,826.68	5,307.42	5,788.16	6,268.91	6,749.65	7,230.39	7,711.13	8,191.88
80.00	125.00	37.22	42.06	44.30	47.05	38.06	33.09	34.55	36.41	38.25	36.81	33.89	31.56	31.56	31.56	31.56	31.56
160.00	125.00	29.72	32.08	35.61	37.69	32.50	29.64	30.55	30.75	30.64	30.38	29.36	28.42	28.42	28.42	28.42	28.42
240.00	125.00	24.28	25.63	28.77	30.16	27.98	26.84	27.39	26.69	25.56	25.86	25.95	25.86	25.86	25.86	25.86	25.86
320.00	125.00	19.69	20.77	24.03	24.95	24.64	24.55	24.83	23.61	21.94	22.53	23.27	23.70	23.70	23.70	23.70	23.70
400.00	125.00	16.58	17.47	20.58	21.27	21.30	21.64	22.48	21.19	19.19	19.69	20.88	21.89	21.89	21.89	21.89	21.89
480.00	125.00	14.30	15.06	17.95	18.52	18.59	18.95	19.80	18.70	16.98	17.31	18.84	20.33	20.33	20.33	20.33	20.33
560.00	125.00	12.58	13.25	15.92	16.41	16.50	16.83	17.53	16.50	14.92	15.34	16.81	18.17	18.17	18.17	18.17	18.17
640.00	125.00	11.23	11.83	14.30	14.72	14.84	15.14	15.72	14.77	13.30	13.66	15.03	16.36	16.36	16.36	16.36	16.36
720.00	125.00	10.14	10.67	12.98	13.34	13.47	13.73	14.25	13.36	11.98	12.22	13.44	14.64	14.64	14.64	14.64	14.64
800.00	125.00	9.25	9.73	11.88	12.20	12.27	12.50	13.03	12.19	10.91	11.05	12.14	13.25	13.25	13.25	13.25	13.25
880.00	125.00	8.50	8.94	10.95	11.25	11.27	11.47	11.98	11.22	10.02	10.09	11.06	12.11	12.11	12.11	12.11	12.11
960.00	125.00	8.42	8.86	10.86	11.16	11.16	11.36	11.89	11.13	9.92	10.00	10.95	12.00	12.00	12.00	12.00	12.00
1,040.00	125.00	8.42	8.86	10.86	11.16	11.16	11.36	11.89	11.13	9.92	10.00	10.95	12.00	12.00	12.00	12.00	12.00
1,120.00	125.00	8.42	8.86	10.86	11.16	11.16	11.36	11.89	11.13	9.92	10.00	10.95	12.00	12.00	12.00	12.00	12.00
1,200.00	125.00	8.42	8.86	10.86	11.16	11.16	11.36	11.89	11.13	9.92	10.00	10.95	12.00	12.00	12.00	12.00	12.00
1,280.00	125.00	8.42	8.86	10.86	11.16	11.16	11.36	11.89	11.13	9.92	10.00	10.95	12.00	12.00	12.00	12.00	12.00
1,360.00	125.00	8.42	8.86	10.86	11.16	11.16	11.36	11.89	11.13	9.92	10.00	10.95	12.00	12.00	12.00	12.00	12.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P16F3_Speed Control External Load f(Oil Temp, RPM)

Description: Specifies the external load table for SPDR torque security as a function of engine oil temperature and engine RPM.

Notes: P16F3, KtSPDC_M_ExternalLoad

y/x	-40.00	-15.00	5.00	32.00	55.00	90.00
200.00	650.00	650.00	650.00	650.00	650.00	650.00
305.00	650.00	650.00	650.00	650.00	650.00	650.00
410.00	650.00	650.00	650.00	650.00	650.00	650.00
515.00	650.00	650.00	650.00	650.00	290.00	200.00
560.00	650.00	650.00	650.00	650.00	245.00	169.32
705.00	348.47	305.43	285.05	280.99	199.88	100.99
875.00	343.45	309.26	288.32	259.00	132.30	80.73
1,050.00	258.44	233.76	218.54	197.74	70.27	49.43
1,300.00	115.81	97.59	86.21	71.41	34.89	27.82
1,600.00	65.57	48.09	37.02	23.41	21.72	21.27
2,000.00	59.37	41.21	29.58	15.93	21.17	22.20
2,500.00	65.40	45.82	33.19	18.80	25.78	26.95
3,200.00	72.68	51.86	38.36	23.32	32.77	34.35
4,000.00	98.94	77.23	63.10	47.61	55.31	56.65
5,000.00	125.20	102.77	88.15	72.28	77.07	76.52
6,100.00	150.57	127.63	112.65	96.51	99.66	98.30
8,000.00	162.74	139.25	123.88	107.45	107.43	104.65

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P219A Normalizer Bank1 Table

Description: Bank 1 Normalizer table used in the calculation of the Ratio for the current sample period.

Notes: DTCs: P219A; Calibration Name: KtFABD_U_Normalizer1; Horizontal axis is RPM; Vertical Axis is Air Per Cylinder (APC) in mg/cylinder

y/x	250	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,500	4,000	4,500	5,000	6,000
40	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
80	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
120	500.00	500.00	500.00	70.00	70.00	75.00	83.25	70.00	62.25	48.75	30.00	30.00	30.00	500.00	500.00	500.00	500.00
160	500.00	500.00	500.00	70.00	70.00	75.00	83.25	70.00	62.25	48.75	30.00	30.00	30.00	500.00	500.00	500.00	500.00
200	500.00	500.00	500.00	84.75	84.75	74.50	109.00	80.50	118.50	65.25	41.00	32.50	32.50	500.00	500.00	500.00	500.00
240	500.00	500.00	500.00	117.75	117.75	131.50	99.50	65.25	91.50	88.00	53.25	32.25	32.25	500.00	500.00	500.00	500.00
280	500.00	500.00	500.00	93.50	93.50	111.50	109.25	70.00	89.25	108.00	54.00	45.00	45.00	500.00	500.00	500.00	500.00
320	500.00	500.00	500.00	110.50	110.50	98.50	86.50	80.00	88.00	92.75	80.00	62.75	62.75	500.00	500.00	500.00	500.00
360	500.00	500.00	500.00	132.25	132.25	89.25	84.00	94.00	85.75	74.75	88.00	83.25	83.25	500.00	500.00	500.00	500.00
400	500.00	500.00	500.00	134.00	134.00	51.75	91.00	112.00	85.50	94.00	84.00	107.75	107.75	500.00	500.00	500.00	500.00
440	500.00	500.00	500.00	110.00	110.00	113.75	105.50	89.00	61.50	77.75	98.25	112.50	112.50	500.00	500.00	500.00	500.00
480	500.00	500.00	500.00	106.25	106.25	123.25	109.75	91.00	64.00	64.00	105.50	105.50	105.50	500.00	500.00	500.00	500.00
520	500.00	500.00	500.00	103.00	103.00	122.50	106.00	89.50	40.75	57.75	86.00	100.25	100.25	500.00	500.00	500.00	500.00
560	500.00	500.00	500.00	93.00	93.00	125.50	112.00	73.75	52.50	74.75	71.50	49.00	49.00	500.00	500.00	500.00	500.00
640	500.00	500.00	500.00	78.00	78.00	104.50	107.00	75.75	41.75	62.25	56.75	49.00	49.00	500.00	500.00	500.00	500.00
720	500.00	500.00	500.00	78.00	78.00	104.50	107.00	75.75	41.75	62.25	56.75	49.00	49.00	500.00	500.00	500.00	500.00
800	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P219A Quality Factor Bank1 Table

Description: Bank 1 lookup table of Quality Factors used in the calculation of the Ratio for the current sample period

Notes: DTCs: P219A; Calibration Name: KtFABD_K_QualFactor1; Horizontal axis is RPM; Vertical Axis is Air Per Cylinder (APC) in mg/cylinder

y/x	250	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,500	4,000	4,500	5,000	6,000
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
240	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
280	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
360	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
400	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
480	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
520	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
640	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
720	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P219A Variance Threshold Bank1 Table

Description: Bank 1 lookup table of Variance metric used to calculate the Ratio for the current sample period

Notes: DTCs: P219A; Calibration Name: KtFABD_U_VarThresh1; Horizontal axis is RPM; Vertical Axis is Air Per Cylinder (APC) in mg/cylinder

y/x	250	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,500	4,000	4,500	5,000	6,000
40	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
80	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
120	500.00	500.00	500.00	19.50	19.50	25.50	20.75	8.75	19.25	22.00	7.50	9.75	9.75	500.00	500.00	500.00	500.00
160	500.00	500.00	500.00	19.50	19.50	25.50	20.75	8.75	19.25	22.00	7.50	9.75	9.75	500.00	500.00	500.00	500.00
200	500.00	500.00	500.00	30.00	30.00	63.50	24.25	22.50	24.75	29.75	8.25	6.00	6.00	500.00	500.00	500.00	500.00
240	500.00	500.00	500.00	33.75	33.75	50.75	38.75	46.50	57.75	44.50	9.75	8.00	8.00	500.00	500.00	500.00	500.00
280	500.00	500.00	500.00	78.50	78.50	55.50	37.50	60.00	76.00	50.50	19.00	10.00	10.00	500.00	500.00	500.00	500.00
320	500.00	500.00	500.00	64.50	64.50	67.75	71.00	114.50	78.25	75.75	20.00	12.50	12.50	500.00	500.00	500.00	500.00
360	500.00	500.00	500.00	55.00	55.00	89.00	81.00	76.00	82.25	110.25	24.50	10.75	10.75	500.00	500.00	500.00	500.00
400	500.00	500.00	500.00	55.00	55.00	131.00	79.50	80.75	85.50	127.50	42.00	9.75	9.75	500.00	500.00	500.00	500.00
440	500.00	500.00	500.00	80.00	80.00	96.00	90.00	96.00	117.00	122.25	25.75	9.75	9.75	500.00	500.00	500.00	500.00
480	500.00	500.00	500.00	96.75	96.75	87.75	86.25	91.25	111.00	111.00	18.50	18.50	18.50	500.00	500.00	500.00	500.00
520	500.00	500.00	500.00	122.25	122.25	92.75	95.25	88.00	123.25	103.75	54.25	26.50	26.50	500.00	500.00	500.00	500.00
560	500.00	500.00	500.00	135.00	135.00	101.00	97.25	96.00	106.50	84.25	82.25	55.50	55.50	500.00	500.00	500.00	500.00
640	500.00	500.00	500.00	155.00	155.00	115.50	90.50	82.50	111.75	91.00	82.75	43.00	43.00	500.00	500.00	500.00	500.00
720	500.00	500.00	500.00	155.00	155.00	115.50	90.50	82.50	111.75	91.00	82.75	43.00	43.00	500.00	500.00	500.00	500.00
800	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P219B Normalizer Bank2 Table

Description: Bank 2 Normalizer table used in the calculation of the Ratio for the current sample period.

Notes: DTCs: P219B; Calibration Name: KtFABD_U_Normalizer2; Horizontal axis is RPM; Vertical Axis is Air Per Cylinder (APC) in mg/cylinder

y/x	250	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,500	4,000	4,500	5,000	6,000
40	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
80	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
120	500.00	500.00	500.00	29.00	29.00	35.25	54.75	33.00	20.50	20.00	19.00	34.25	34.25	500.00	500.00	500.00	500.00
160	500.00	500.00	500.00	29.00	29.00	35.25	54.75	33.00	20.50	20.00	19.00	34.25	34.25	500.00	500.00	500.00	500.00
200	500.00	500.00	500.00	122.00	122.00	136.25	69.75	38.00	34.00	45.00	28.00	43.50	43.50	500.00	500.00	500.00	500.00
240	500.00	500.00	500.00	160.50	160.50	215.75	76.00	53.50	64.50	106.00	57.50	59.75	59.75	500.00	500.00	500.00	500.00
280	500.00	500.00	500.00	170.00	170.00	220.75	94.75	66.75	75.00	84.25	79.75	110.00	110.00	500.00	500.00	500.00	500.00
320	500.00	500.00	500.00	209.75	209.75	155.75	114.75	106.00	126.50	102.75	84.00	94.75	94.75	500.00	500.00	500.00	500.00
360	500.00	500.00	500.00	191.25	191.25	138.50	176.00	139.50	158.25	141.50	118.00	139.00	139.00	500.00	500.00	500.00	500.00
400	500.00	500.00	500.00	169.00	169.00	162.50	192.50	173.00	216.00	150.75	195.50	148.50	148.50	500.00	500.00	500.00	500.00
440	500.00	500.00	500.00	204.00	204.00	150.00	144.00	144.00	168.50	125.75	145.75	116.25	116.25	500.00	500.00	500.00	500.00
480	500.00	500.00	500.00	124.75	124.75	110.00	144.75	217.00	220.75	120.00	118.75	116.00	116.00	500.00	500.00	500.00	500.00
520	500.00	500.00	500.00	120.50	120.50	154.00	139.00	215.00	239.00	115.75	120.25	105.00	105.00	500.00	500.00	500.00	500.00
560	500.00	500.00	500.00	183.25	183.25	152.25	164.50	125.75	145.75	100.00	97.25	80.00	80.00	500.00	500.00	500.00	500.00
640	500.00	500.00	500.00	169.75	169.75	189.50	163.25	155.00	149.00	130.50	69.50	67.25	67.25	500.00	500.00	500.00	500.00
720	500.00	500.00	500.00	169.75	169.75	189.50	163.25	155.00	149.00	130.50	69.50	67.25	67.25	500.00	500.00	500.00	500.00
800	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P219B Quality Factor Bank2 Table

Description: Bank 2 lookup table of Quality Factors used in the calculation of the Ratio for the current sample period

Notes: DTCs: P219B; Calibration Name: KtFABD_K_QualFactor2; Horizontal axis is RPM; Vertical Axis is Air Per Cylinder (APC) in mg/cylinder

y/x	250	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,500	4,000	4,500	5,000	6,000
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
240	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
280	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
360	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
400	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
480	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
520	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
640	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
720	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P219B Variance Threshold Bank2 Table

Description: Bank 2 lookup table of Variance metric used to calculate the Ratio for the current sample period

Notes: DTCs: P219B; Calibration Name: KtFABD_U_VarThresh2; Horizontal axis is RPM; Vertical Axis is Air Per Cylinder (APC) in mg/cylinder

y/x	250	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,500	4,000	4,500	5,000	6,000
40	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
80	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
120	500.00	500.00	500.00	7.50	7.50	14.75	15.75	6.00	7.00	7.25	5.25	14.50	14.50	500.00	500.00	500.00	500.00
160	500.00	500.00	500.00	7.50	7.50	14.75	15.75	6.00	7.00	7.25	5.25	14.50	14.50	500.00	500.00	500.00	500.00
200	500.00	500.00	500.00	11.25	11.25	34.00	23.00	15.50	9.50	16.00	9.75	21.50	21.50	500.00	500.00	500.00	500.00
240	500.00	500.00	500.00	12.25	12.25	34.50	19.50	16.50	10.25	14.00	14.00	31.00	31.00	500.00	500.00	500.00	500.00
280	500.00	500.00	500.00	18.50	18.50	34.75	22.00	16.25	11.25	15.50	16.00	30.50	30.50	500.00	500.00	500.00	500.00
320	500.00	500.00	500.00	20.75	20.75	87.50	31.75	52.50	14.50	24.25	25.00	43.00	43.00	500.00	500.00	500.00	500.00
360	500.00	500.00	500.00	27.50	27.50	110.00	57.00	98.25	20.75	58.00	41.50	50.50	50.50	500.00	500.00	500.00	500.00
400	500.00	500.00	500.00	106.00	106.00	139.50	99.75	93.00	29.50	73.00	48.50	63.75	63.75	500.00	500.00	500.00	500.00
440	500.00	500.00	500.00	97.50	97.50	242.50	268.75	144.75	79.50	97.25	73.75	75.50	75.50	500.00	500.00	500.00	500.00
480	500.00	500.00	500.00	187.50	187.50	208.00	191.25	74.50	70.75	160.00	116.50	72.75	72.75	500.00	500.00	500.00	500.00
520	500.00	500.00	500.00	195.50	195.50	154.25	192.25	72.50	58.50	112.50	116.50	83.50	83.50	500.00	500.00	500.00	500.00
560	500.00	500.00	500.00	142.50	142.50	160.75	143.75	114.00	90.00	125.50	108.75	141.00	141.00	500.00	500.00	500.00	500.00
640	500.00	500.00	500.00	152.25	152.25	106.00	135.25	83.25	90.00	111.00	113.75	109.00	109.00	500.00	500.00	500.00	500.00
720	500.00	500.00	500.00	152.25	152.25	106.00	135.25	83.25	90.00	111.00	113.75	109.00	109.00	500.00	500.00	500.00	500.00
800	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0011_CamPosErrorLimlc1

Description: P0011 - Cam Position Error Limit for performance diagnostic

Notes: KtPHSD_phi_CamPosErrorLimlc1

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
800	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1,200	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1,600	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
2,000	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
2,400	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
2,800	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
3,200	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
3,600	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4,000	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4,400	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4,800	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
5,200	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
5,600	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
6,000	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
6,400	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
6,800	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0

14 OBDG12 ECM Supporting Tables
Initial Supporting table - P0011_PerfMaxlc1

Description: P0011 - Range of phaser travel where diagnostic cannot make a decision if both desired & measured positions are greater than

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
2	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
3	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
4	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
5	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
6	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
7	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
8	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
9	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
10	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
11	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
12	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
13	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
14	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
15	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
16	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
17	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0011_StablePositionTimelc1

Description: P0011 - Delay after transient move

Notes: KtPHSD_t_StablePositionTimelc1

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
800	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
1,200	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
1,600	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
2,000	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
2,400	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
2,800	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
3,200	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
3,600	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4,000	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4,400	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4,800	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
5,200	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
5,600	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
6,000	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
6,400	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
6,800	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0442: Volatility Time as a Function of Estimate of Ambient Temperature

Description: Data is Volatility Time (in seconds) and Axis is Estimated Ambient Coolant in Deg C

Notes: KtEONV_t_VolatilityTimeMax

y/x	-10	-4	1	7	13	18	24	29	35	41	46	52	58	63	69	74	80
1	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0442: Engine Off Time Before Vehicle Off Maximum as a Function of Estimated Ambient Temperature Table

Description: Data is Engine Off Time Before Vehicle Off Maximum Table (in seconds) and Axis is Estimated Ambient Coolant in Deg C

Notes: KtEONV_t_EngOffTimeBefVehOffMax

y/x	-10	-4	1	7	13	18	24	29	35	41	46	52	58	63	69	74	80
1	70	70	70	70	74	82	105	153	320	480	480	480	480	480	480	480	480

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0442: EONV Pressure Threshold (Pascals) Table

Description: Data is EONV Pressure Threshold in Pascals, X axis (horizontal) is fuel level in % from 0 to 100 with step size 6.25, and Y axis (vertical) is temperature in deg C from -10 to 80 with step size 5.625

Notes: KtEONV_p_PressureThreshold

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
2	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
3	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
4	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
6	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
7	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
8	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
9	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
10	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
11	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
12	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
13	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
14	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
15	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
16	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5
17	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5	-124.5

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0442: Estimate of Ambient Temperature Valid Conditioning Time as a Function of Ignition Off Time Table

Description: Data is EAT Valid Conditioning Time (in seconds) and Axis is Ignition Off Time (in seconds)

Notes: KtEONV_t_IdleCondTimePreset

P0442: Estimate of Ambient Temperature Valid Conditioning Time as a Function of Ignition Off Time Table - Part 1

y/x	0	600	1,200	1,800	2,400	3,000	3,600	4,200	4,800	5,400	6,000	6,600	7,200	7,800	8,400	9,000	9,600
1	200	300	300	300	300	300	300	300	300	300	300	300	300	295	290	285	280

P0442: Estimate of Ambient Temperature Valid Conditioning Time as a Function of Ignition Off Time Table - Part 2

y/x	10,200	10,800	11,700	12,600	13,500	14,400	15,300	16,200	17,100	18,000	19,200	20,400	21,600	22,800	24,000	25,200	
1	275	270	265	260	255	250	245	240	235	230	225	220	215	210	205	200	

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0496: Purge Valve Leak Test Engine Vacuum Test Time (Cold Start) as a Function of Fuel Level Table

Description: Data is Purge Valve Leak Test Engine Vacuum Test Time (in seconds) and Axis is Fuel Level in %

Notes: KtEVPD_t_PVLT_EngineVacTimeCold

y/x	0	6	12	19	25	31	37	44	50	56	62	69	75	81	87	94	100
1	62	60	57	55	53	50	48	46	44	41	39	37	34	32	30	27	25

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KaFCLP_U_SlphrIntgIOfst_Thrsh

Description: Integral Offset voltage thresholds (bank and cell specific calcs) used with KeFCLP_Pct_CatAccuSlphrPostDsbl to check for sulphur poisoning.

Notes: millivolts

y/x	CiOXYR_O2_PostCat1	CiOXYR_O2_PostCat2
CiFCLP_Decel	1,000	1,000
CiFCLP_Idle	1,000	1,000
CiFCLP_Cruise	1,000	1,000
CiFCLP_LightAccel	1,000	1,000
CiFCLP_HeavyAccel	1,000	1,000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KcFCLP_Cnt_O2RdyCyclesThrsh

Description: Number of post catalyst oxygen sensor samples which must be outside not ready window before post oxygen sensor is READY.

Notes: Time (events * 12.5 milliseconds)

y/x	1
1	10

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KcFULC_O2_SensorReadyEvents

Description: Number of times an oxygen sensor value must be in range before declaring it ready

Notes: Time (events * 12.5 milliseconds)

y/x	
1	10

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_Pct_CatAccuSlphrPostDsbl

Description: Sulphur percent threshold above which post integral learning is disabled if the threshold criteria KaFCLP_U_SlphrIntglOfst_Thrsh is also met.

Notes: Percent

y/x	1
1	75

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_T_IntegrationCatalystMax

Description: Maximum allowed estimated catalytic converter temperature for post O2 integral terms to be updated.

Notes: Modeled catalyst Temperature in Celcius

y/x	1
1	950

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_T_IntegrationCatalystMin

Description: Minimum allowed estimated catalytic converter temperature to begin using post O2 integration correction terms. Converter temperature must remain above this threshold to ramp-in the post O2 integration adjustments. Once the ramp-in has started, a converter temperature below this threshold will freeze the ramp-in multiplier. Post O2 integration will not be allowed below this converter temperature

Notes: Modeled catalyst Temperature in Celcius

y/x	1
1	500

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KfFCLL_T_AdaptiveHiCoolant

Description: LTM learning is inhibited if the engine coolant temperature is above this calibration.

Notes: Degrees Celcius

y/x	
1	140

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KfFCLL_T_AdaptiveLoCoolant

Description: LTM learning is inhibited if the engine coolant temperature is below this calibration.

Notes: Degrees Celcius

y/x	1
1	39

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KfFCLP_U_O2ReadyThrshLo

Description: Lower threshold defining not ready window for post oxygen sensor voltage.

Notes: Voltage in millivolts

y/x	1
1	1,100

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KfFULC_U_O2_SensorReadyThrshLo

Description: Lower limit checked against when determining if an oxygen sensor is in range

Notes: Voltage in millivolts

y/x	1
1	1,795

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KtFCLL_p_AdaptiveLowMAP_Limit

Description: KtFCLL_p_AdaptiveLowMAP_Limit

Notes: MAP in KPa

y/x	65	70	75	80	85	90	95	100	105
1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KtFCLP_t_PostIntglDisableTime

Description: Disable integral offset after engine start for this amount of time.

Notes: Time in seconds

y/x	-40	-29	-18	-6	5	16	28	39	50	61	73	84	95	106	118	129	140
1	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KtFCLP_t_PostIntglRampInTime

Description: Time required to ramp integral offset to desired value.

Notes: Time in seconds

y/x	-40	-29	-18	-6	5	16	28	39	50	61	73	84	95	106	118	129	140
1	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KtFSTA_t_ClosedLoopAutostart

Description: Engine run time following an autostart, as a function of begin run coolant, which must be exceeded to enable CLOSED LOOP.

Notes: Time in seconds: Hybrid use Only

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	360.0	300.0	240.0	180.0	130.0	90.0	60.0	40.0	20.0	15.0	11.0	7.0	7.0	11.0	11.0	11.0	11.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - Closed Loop Enable Clarification - KtFSTA_t_ClosedLoopTime

Description: Engine run time, as a function of startup coolant temperature, which must be exceeded to enable CLOSED LOOP.

Notes: Time in seconds

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	360.0	300.0	240.0	180.0	130.0	90.0	60.0	40.0	20.0	15.0	11.0	7.0	7.0	11.0	11.0	11.0	11.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300 EngineOverSpeedLimit

Description: Engine OverSpeed Limit versus gear

Notes: Used for P0300-P0308. Cal Name: KaEOSC_n_EngOvrspdLimitGear

P0300 EngineOverSpeedLimit - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6
1	5,000	5,000	5,000	5,000	5,000	5,000

P0300 EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGrEVT 1	CeTGRR_e_TransGrEVT 2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	
1	5,000	5,000	4,000	5,000	4,000	

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300 Number of Normals

Description: Number of Normals for the Driveline Ring Filter
 After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_NumOfNormalsFil

y/x	0	1	2	3	4	5	6	7	8
1	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

14 OBDG12 ECM Supporting Tables
Initial Supporting table - P0300 Ring Filter

Description: Driveline Ring Filter
 After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_RingFilter

y/x	0	1	2	3	4	5	6	7	8
1	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_Abnormal Cylinder Mode

Description: Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (Cylinder Mode Equation)

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_CylAbnormal

y/x	0	1	2	3	4	5	6	7	8
1	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_Abnormal Rev Mode

Description: Abnormal Rev Mode Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (Rev Mode Equation)

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_RevAbnormal

y/x	0	1	2	3	4	5	6	7	8
1	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_Abnormal SCD Mode

Description: Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (SCD Mode Equation)

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_SCD_CylAbnormal

y/x	0	1	2	3	4	5	6	7	8
1	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

14 OBDG12 ECM Supporting Tables
Initial Supporting table - P0300_AFM_Decel

Description: Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_DoDCylinderMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
9	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
11	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
13	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
15	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
17	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
19	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
25	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
29	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
33	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
38	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
42	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
48	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
54	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
61	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_Catalyst_Damage_Misfire_Percentage

Description: Catalyst Damaging Misfire Percentage" Table whenever secondary conditions are met.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_Pct_CatalystMisfire

y/x	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000
0	10.6	10.6	10.6	10.0	4.8	4.8	4.8	4.8
10	10.6	10.6	10.6	10.0	4.8	4.8	4.8	4.8
20	10.6	10.6	10.6	10.0	4.8	4.8	4.8	4.8
30	10.6	10.6	9.8	8.1	4.8	4.8	4.8	4.8
40	10.6	10.6	8.1	8.1	4.8	4.8	4.8	4.8
50	8.1	8.1	6.8	4.8	4.8	4.8	4.8	4.8
60	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
70	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
80	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
90	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
100	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_CylMode_Decel

Description: Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_CylinderMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	
8	1,300	1,100	800	650	400	280	200	170	160	110	60	50	36	27	20	15	13	12	6	5	5	4	3	3	3	3	3
9	1,200	1,000	750	600	380	280	200	170	160	100	60	45	36	27	19	15	12	11	6	5	4	4	3	3	3	3	3
11	1,200	1,000	650	500	360	275	200	160	125	80	55	40	30	25	17	14	12	10	6	4	4	4	3	3	3	3	3
12	1,300	1,100	700	550	375	275	200	150	120	75	50	35	26	22	16	13	10	10	5	4	4	4	3	3	3	3	3
13	1,200	1,000	700	550	350	250	175	150	125	65	50	35	28	22	15	12	10	10	6	4	4	4	3	3	3	3	3
15	1,400	1,200	800	600	400	275	200	150	140	80	60	40	30	25	17	14	12	10	6	4	4	4	3	3	3	3	3
17	1,500	1,300	900	600	400	300	225	160	140	90	65	45	42	26	18	16	14	11	6	5	4	4	3	3	3	3	3
19	1,600	1,400	1,000	700	500	325	275	175	160	100	75	55	40	30	22	16	15	12	6	5	4	4	3	3	3	3	3
22	1,700	1,500	1,100	800	500	350	300	200	180	120	90	65	50	35	26	20	16	14	7	5	4	4	3	3	3	3	3
25	1,800	1,600	1,200	900	700	450	350	250	200	140	100	70	55	40	30	24	20	16	8	6	5	4	3	3	3	3	3
29	1,900	1,700	1,300	1,000	800	550	400	300	220	150	110	80	60	42	35	25	22	18	8	6	5	4	3	3	3	3	3
33	2,000	1,800	1,400	1,200	900	650	500	350	235	160	130	90	60	45	40	30	24	20	9	7	5	4	3	3	3	3	3
38	2,000	1,800	1,600	1,400	1,000	750	600	400	250	180	140	100	70	55	45	35	30	22	10	7	6	5	3	3	3	3	3
42	2,200	2,000	1,800	1,600	1,100	950	700	500	300	220	150	110	80	60	50	40	32	25	11	8	6	5	4	4	4	4	4
48	2,200	2,000	1,800	1,600	1,200	1,000	800	550	375	230	150	125	95	75	55	45	35	30	12	9	6	5	4	4	4	4	4
54	2,200	2,000	1,800	1,600	1,200	1,000	800	600	400	240	180	125	100	80	60	50	40	30	14	10	7	6	5	5	5	5	5
61	2,200	2,000	1,800	1,600	1,200	1,000	800	700	500	300	250	170	110	85	65	55	45	40	16	11	8	6	6	6	6	6	6

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_CylMode_Jerk

Description: Crankshaft jerk threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_ddt_CylinderMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	
8	1,300	1,100	800	650	400	280	200	170	160	110	50	50	35	27	20	15	13	12	0	0	0	0	0	0	0	0	0
9	1,200	1,000	750	600	380	280	200	170	160	100	60	45	35	27	19	15	12	11	0	0	0	0	0	0	0	0	0
11	1,200	1,000	650	500	360	275	200	150	110	80	50	40	28	25	17	14	12	10	0	0	0	0	0	0	0	0	0
12	1,300	1,100	700	550	350	275	200	140	110	80	50	35	24	22	16	13	10	10	0	0	0	0	0	0	0	0	0
13	1,200	1,000	700	550	350	250	175	150	115	80	50	35	28	22	15	12	10	10	0	0	0	0	0	0	0	0	0
15	1,400	1,200	800	600	400	275	200	150	140	85	50	40	30	25	17	14	12	10	0	0	0	0	0	0	0	0	0
17	1,500	1,300	900	600	400	300	225	160	140	90	50	45	35	26	18	16	14	11	0	0	0	0	0	0	0	0	0
19	1,600	1,400	1,000	700	500	325	275	175	160	100	70	55	38	30	22	16	15	12	0	0	0	0	0	0	0	0	0
22	1,700	1,500	1,100	800	500	350	300	200	180	120	75	65	40	35	26	20	16	14	0	0	0	0	0	0	0	0	0
25	1,800	1,600	1,200	900	700	450	350	250	200	140	90	70	50	40	30	24	20	16	0	0	0	0	0	0	0	0	0
29	1,900	1,700	1,300	1,000	900	550	400	300	220	150	90	80	50	42	35	25	22	18	0	0	0	0	0	0	0	0	0
33	2,000	1,800	1,500	1,200	1,000	650	500	350	235	160	110	90	60	45	40	30	24	20	0	0	0	0	0	0	0	0	0
38	2,000	1,800	1,600	1,400	1,100	750	600	400	250	180	140	100	70	55	45	35	30	22	0	0	0	0	0	0	0	0	0
42	2,200	2,000	1,800	1,600	1,200	950	700	500	300	220	150	110	80	60	50	40	32	25	0	0	0	0	0	0	0	0	0
48	2,200	2,000	1,800	1,600	1,200	1,000	800	550	375	230	175	125	95	75	55	45	35	30	0	0	0	0	0	0	0	0	0
54	2,200	2,000	1,800	1,600	1,200	1,000	800	600	400	240	180	125	100	80	60	50	40	30	0	0	0	0	0	0	0	0	0
61	2,200	2,000	1,800	1,600	1,200	1,000	800	700	500	300	250	170	110	85	65	55	45	40	0	0	0	0	0	0	0	0	0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_IdleCylModeDecel

Description: Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_dt_IdleCylinderMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600
8	1,100	1,000	650	450	350	250	225	150	120	100	75	70	60
9	1,200	1,100	650	450	350	300	225	150	130	100	75	70	60
11	1,200	1,100	700	450	350	300	225	150	130	100	75	70	60
12	1,300	1,200	800	450	350	300	225	150	130	100	75	70	60
13	1,300	1,200	800	550	350	300	225	150	130	100	75	70	60
14	1,200	1,100	800	550	350	300	225	150	130	100	75	70	60
15	1,100	1,000	800	650	450	325	225	150	120	90	75	70	60
16	1,100	1,000	900	650	425	325	250	160	120	90	75	70	60
17	1,300	1,200	900	650	425	300	250	175	120	110	75	70	60
18	1,400	1,300	900	650	425	300	250	175	130	110	80	70	60
19	1,500	1,400	900	650	425	325	250	175	130	120	80	80	60
21	1,600	1,500	900	650	450	325	250	175	130	120	85	80	70
22	1,700	1,600	1,000	650	450	325	250	190	130	120	100	80	70
24	1,800	1,700	1,000	750	450	325	230	190	150	120	100	80	70
25	1,900	1,800	1,050	750	450	325	230	190	160	130	100	80	80
27	2,000	1,900	1,100	800	500	325	250	190	150	140	110	80	80
29	2,100	2,000	1,150	900	550	350	275	200	160	140	110	110	100

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_IdleCylModeJerk

Description: Crankshaft jerk threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_ddt_IdleCylinderMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600
8	1,100	1,100	600	450	350	300	200	150	130	100	75	70	60
9	1,200	1,100	600	450	350	300	200	150	130	100	75	70	60
11	1,200	1,100	650	450	350	300	200	150	130	100	75	70	60
12	1,300	1,100	700	450	350	300	200	150	130	100	75	70	60
13	1,300	1,100	700	550	350	300	200	150	130	100	75	70	60
14	1,200	1,000	700	550	350	300	200	150	130	100	75	70	60
15	1,100	900	700	600	450	280	200	150	120	100	75	70	60
16	1,100	1,000	800	600	425	280	200	150	120	90	75	70	60
17	1,300	1,200	800	600	425	280	200	175	110	100	75	70	60
18	1,400	1,300	800	600	425	250	200	170	110	100	80	70	60
19	1,500	1,400	800	600	375	250	200	150	110	100	80	80	60
21	1,600	1,500	800	600	375	250	200	140	110	100	80	80	70
22	1,700	1,600	900	600	375	250	200	150	110	100	80	80	70
24	1,800	1,700	1,000	700	400	275	200	150	120	100	90	80	70
25	1,900	1,800	1,050	700	400	275	210	150	120	100	95	80	80
27	2,000	1,900	1,100	800	500	300	250	160	120	100	100	80	80
29	2,100	2,000	1,150	900	550	350	275	180	120	100	100	90	100

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_IdleSCD_Decel

Description: Crankshaft decel threshold while in SCD mode. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_dt_SCD_IdleMode

Note: Misfire's Load term is %, but not PID\$04. PID \$04 is not robust to temperature and altitude shifts. (especially decel and jerk thresholds since they track actual air trapped in cylinder)

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600
8	550	500	400	200	150	110	100	90	50	32,767	32,767	32,767	32,767
9	550	500	400	200	150	110	100	90	50	32,767	32,767	32,767	32,767
11	550	500	400	200	150	110	100	90	50	32,767	32,767	32,767	32,767
12	550	450	400	200	150	110	100	90	50	32,767	32,767	32,767	32,767
13	550	475	360	230	150	110	110	90	50	32,767	32,767	32,767	32,767
14	550	475	330	260	190	130	110	80	50	32,767	32,767	32,767	32,767
15	550	475	360	260	190	140	110	75	50	32,767	32,767	32,767	32,767
16	600	525	400	270	190	130	95	70	50	32,767	32,767	32,767	32,767
17	600	550	400	250	190	120	100	75	40	32,767	32,767	32,767	32,767
18	600	550	425	270	190	130	110	80	50	32,767	32,767	32,767	32,767
19	700	600	425	270	200	140	120	80	55	32,767	32,767	32,767	32,767
21	800	700	450	270	200	140	120	80	60	32,767	32,767	32,767	32,767
22	900	750	475	300	200	150	100	80	60	32,767	32,767	32,767	32,767
24	1,000	800	500	325	220	160	100	80	60	32,767	32,767	32,767	32,767
25	1,100	900	600	350	240	170	120	80	60	32,767	32,767	32,767	32,767
27	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
29	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

14 OBDG12 ECM Supporting Tables
Initial Supporting table - P0300_IdleSCD_Jerk

Description: Crankshaft jerk threshold while in SCD mode. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_ddt_SCD_IdleMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600
8	550	500	400	200	150	110	100	90	50	32,767	32,767	32,767	32,767
9	550	500	400	200	150	110	100	90	50	32,767	32,767	32,767	32,767
11	550	500	400	200	150	110	100	90	50	32,767	32,767	32,767	32,767
12	550	450	400	200	150	110	100	90	50	32,767	32,767	32,767	32,767
13	550	500	375	230	150	110	100	90	50	32,767	32,767	32,767	32,767
14	550	500	375	240	170	110	100	80	50	32,767	32,767	32,767	32,767
15	550	500	375	240	170	110	90	75	50	32,767	32,767	32,767	32,767
16	600	550	375	250	170	110	75	70	50	32,767	32,767	32,767	32,767
17	600	550	375	250	180	120	80	75	40	32,767	32,767	32,767	32,767
18	600	550	375	270	180	130	100	80	50	32,767	32,767	32,767	32,767
19	700	600	375	270	180	140	110	80	50	32,767	32,767	32,767	32,767
21	800	700	400	270	180	115	105	80	55	32,767	32,767	32,767	32,767
22	900	750	400	300	180	120	90	80	55	32,767	32,767	32,767	32,767
24	1,000	800	500	325	200	130	100	70	50	32,767	32,767	32,767	32,767
25	1,100	900	600	350	220	140	120	80	50	32,767	32,767	32,767	32,767
27	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
29	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_Max_PatternMultiplier

Description: Crankshaft should return to normal after the misfire. If crankshaft snap value after the misfire being evaluated is larger than the misfire's Jerk threshold times this multiplier, its not a real misfire. However, if random misfire occurs every engine cycle, more noise is allowed to be considered "normal" since the crankshaft does not have time to fully return to normal before the next misfire occurs.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_K_SCD_MaxPptrnRecogMult

y/x	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_Min_PatternMultiplier

Description: Crankshaft should return to normal after the misfire. If crankshaft snap value after single isolated misfire being evaluated is larger than the misfire's Jerk threshold times this multiplier, its not a real misfire.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_K_SCD_MinPtttrnRecogMult

y/x	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
1	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_RevMode_Decel

Description: Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_RevolutionMode

y/x	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	110	75	45	35	26	25	25	25	25
9	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	100	60	40	30	25	24	24	24	24
11	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	95	60	40	35	26	24	24	24	24
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	100	60	40	35	28	24	24	24	24
13	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	110	70	50	40	28	24	24	24	24
15	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	115	80	55	45	32	26	26	26	26
17	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	120	90	65	50	35	32	32	32	32
19	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	140	100	75	55	45	35	35	35	35
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	160	120	80	65	50	40	40	40	40
25	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	180	140	100	75	60	45	45	45	45
29	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	200	150	110	85	70	55	55	55	55
33	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	220	180	120	100	80	60	60	60	60
38	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	280	220	140	120	80	70	70	70	70
42	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	320	240	160	130	100	80	80	80	80
48	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	350	290	180	145	110	90	90	90	90
54	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	370	320	200	150	120	100	100	100	100
61	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	400	350	230	155	140	140	140	140	140

14 OBDG12 ECM Supporting Tables
Initial Supporting table - P0300_SCD_Decel

Description: Crankshaft decel threshold. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_dt_SCD_OffIdleMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
8	600	450	300	220	150	130	90	70	55	32,767	32,767	32,767	32,767
9	570	420	275	180	135	110	85	65	50	32,767	32,767	32,767	32,767
11	550	400	250	180	135	110	85	60	45	32,767	32,767	32,767	32,767
12	550	400	275	190	140	115	75	60	50	32,767	32,767	32,767	32,767
13	650	500	320	220	160	115	80	60	50	32,767	32,767	32,767	32,767
15	700	550	350	240	170	115	90	70	55	32,767	32,767	32,767	32,767
17	700	550	380	260	180	120	90	70	60	32,767	32,767	32,767	32,767
19	750	600	425	300	200	140	100	80	65	32,767	32,767	32,767	32,767
22	750	600	500	350	220	160	120	90	75	32,767	32,767	32,767	32,767
25	1,050	900	750	400	275	180	140	120	90	32,767	32,767	32,767	32,767
29	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
33	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
38	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
42	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
48	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
54	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
61	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

14 OBDG12 ECM Supporting Tables
Initial Supporting table - P0300_SCD_Jerk

Description: Crankshaft jerk threshold. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_ddt_SCD_OffIdleMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
8	600	450	300	220	150	130	90	70	55	32,767	32,767	32,767	32,767
9	570	420	275	180	135	110	85	65	50	32,767	32,767	32,767	32,767
11	550	400	250	180	135	110	85	60	45	32,767	32,767	32,767	32,767
12	550	400	275	190	140	115	75	60	50	32,767	32,767	32,767	32,767
13	650	500	320	220	160	115	80	60	50	32,767	32,767	32,767	32,767
15	700	550	350	240	170	115	90	70	55	32,767	32,767	32,767	32,767
17	700	550	380	260	180	120	90	70	60	32,767	32,767	32,767	32,767
19	750	600	425	300	200	140	100	80	65	32,767	32,767	32,767	32,767
22	750	600	500	350	220	160	120	90	75	32,767	32,767	32,767	32,767
25	1,050	900	750	400	275	180	140	120	90	32,767	32,767	32,767	32,767
29	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
33	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
38	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
42	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
48	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
54	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
61	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_TOSSRoughRoadThres

Description: Only used if Rough Road source = TOSS: dispersion value on Transmission Output Speed Sensor above which rough road is indicated present

Notes: Used for P0300-P0308. Cal Name: KtRRDI_a_RoughRoadThresh

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000
100	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
300	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
900	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,200	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,500	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,800	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2,100	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2,400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2,700	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3,000	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3,300	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3,600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4,200	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_WSSRoughRoadThres

Description: Only used if Wheel speed from ABS is used. If difference between wheel speed readings is larger than this limit, rough road is present

Notes: Used for P0300-P0308. Cal Name: KtRRDI_a_WhlSpdRoughRoadLim

y/x	0	12	24	36	48	60	72	85	97	109	121	133	145	157	169	181	193
1	0.40	0.44	0.48	0.52	0.56	0.60	0.64	0.68	0.72	0.76	0.80	0.84	0.88	0.92	0.96	1.00	1.04

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_ZeroTorqBaro

Description: adjusts zero torque for altitude

Notes: Used for P0300-P0308. Cal Name: KtMSFD_K_ZeroTorqBaro

y/x	65	70	75	80	85	90	95	100	105
1	0.82	0.85	0.88	0.90	0.93	0.95	0.97	1.00	1.03

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_ZeroTorqDoD

Description: Zero torque engine load while in Active Fuel Management

Notes: Used for P0300-P0308. Cal Name: KtMSFD_ZeroTorqDoD

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	11.00	9.50	8.75	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.75	9.00	9.00	9.00	9.00	11.23	13.46	15.69	17.92	20.14	22.38	24.60	26.83

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0300_ZeroTorqueEngLoad

Description: %air load that represents Zero Brake torque along the Neutral rev line. The Zero torque threshold is adjusted for Baro via P0300_ZeroTorqueBaro

Notes: Used for P0300-P0308. Cal Name: KtMISF_ZeroTorqSpd

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	11.00	9.50	8.75	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.75	9.00	9.00	9.00	9.00	11.23	13.46	15.69	17.92	20.14	22.38	24.60	26.83

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0521_Eng_Load_Stability_Weighting_Factor

Description: Engine Load Stability Weighting Factor

Notes: KtEOPD_r_EngLoadStblWeight with axis as Engine Load Stability defined by KnEOPD_m_EngLoadStabilityBpt

y/x	0	5	10	20	30	50	100	200	399
1	1.00	1.00	1.00	0.30	0.00	0.00	0.00	0.00	0.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0521_Eng_Load_Stability_Weighting_Factor_Axis

Description: Engine Load Stability Weighting Factor Axis

Notes: KnEOPD_m_EngLoadStabilityBpt engine load axis used by KtEOPD_r_EngLoadStblWeight

y/x	1	2	3	4	5	6	7	8	9
1	0	5	10	20	30	50	100	200	399

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0521_Eng_Oil_Pred_Weighting_Factor

Description: Oil Pressure Predicted Weighting Factor

Notes: KtEOPD_r_EOP_PredictWeight with axis as Predicted Oil Pressure defined by KnEOPD_p_EngOilPredictedBpt

y/x	160	170	250	275	360	375	400	450	600
1	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0521_Eng_Oil_Pred_Weighting_Factor_Axis

Description: Oil Pressure Predicted Weighting Factor Axis

Notes: KnEOPD_p_EngOilPredictedBpt predicted oil pressure axis used by KtEOPD_r_EOP_PredictWeight

y/x	1	2	3	4	5	6	7	8	9
1	160	170	250	275	360	375	400	450	600

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0521_Oil_Temp_Weighting_Factor

Description: Oil Temperature Weighting Factor

Notes: KtEOPD_r_EOT_Weight with axis as Oil Temperature defined by KnEOPD_T_EngFilteredBpt

y/x	-10	-5	60	80	90	100	120	130	140
1	0.00	0.70	0.70	0.70	0.70	0.70	0.70	0.35	0.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0521_Oil_Temp_Weighting_Factor_Axis

Description: Oil Temperature Weighting Factor Axis

Notes: KnEOPD_T_EngFilteredBpt oil temperature axis for use by KtEOPD_r_EOT_Weight

y/x	1	2	3	4	5	6	7	8	9
1	-10	-5	60	80	90	100	120	130	140

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0521_RPM_Weighting_Factor

Description: Engine RPM Weighting Factor

Notes: KtEOPD_r_EngSpdWeight with axis as Engine RPM defined by KnEOPD_n_EngSpdFilteredBpt

y/x	0	500	900	1,000	2,000	3,000	3,500	4,000	5,000
1	0.00	0.00	0.00	0.45	0.45	0.45	0.45	0.20	0.00

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0521_RPM_Weighting_Factor_X_Axis

Description: Engine RPM Weighting Factor Axis

Notes: KnEOPD_n_EngSpdFilteredBpt Engine RPM Axis for use by KtEOPD_r_EngSpdWeight

y/x	1	2	3	4	5	6	7	8	9
1	0	500	900	1,000	2,000	3,000	3,500	4,000	5,000

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0420_BestFailingOSCTableB1

Description: This table is a 9x17 table of baseline Best Failing (e.g. threshold converter) OSC times for catalyst Bank 1. The axis' for this table include the average airflow and the catalyst temperature. After OSC is measured for a specific temp and airflow, the BestFailing OSC value is found within this table for the measured temp and airflow and is used along with the OSC_TimeRaw (and the WorstPassing value) to calculate the Normalized Ratio for that specific test. The values in this table are based on the measured OSC for the identified BPU converter that is used for MIL illumination across the specific temp and airflow range for a given program.

Notes: KtCATD_t_1_OSC_BestFailing - Used for P0420 norm ratio calculation

y/x	7.00	7.75	8.50	9.25	10.00	10.75	11.50	12.25	13.00	13.75	14.50	15.25	16.00	16.75	17.50	18.25	19.00
510.00	2.29	2.19	2.06	1.92	1.79	1.66	1.52	1.41	1.33	1.27	1.21	1.14	1.06	0.99	0.94	0.90	0.85
550.00	2.43	2.31	2.19	2.04	1.89	1.75	1.61	1.50	1.42	1.33	1.25	1.18	1.10	1.05	0.98	0.93	0.89
590.00	2.54	2.43	2.28	2.13	1.96	1.82	1.70	1.59	1.50	1.41	1.33	1.25	1.17	1.10	1.04	0.97	0.92
630.00	2.61	2.49	2.33	2.17	2.03	1.89	1.78	1.67	1.57	1.49	1.39	1.30	1.22	1.14	1.07	1.02	0.96
670.00	2.64	2.52	2.38	2.23	2.08	1.95	1.83	1.73	1.64	1.54	1.44	1.35	1.26	1.18	1.10	1.04	0.96
710.00	2.67	2.55	2.41	2.26	2.12	1.99	1.88	1.77	1.68	1.58	1.48	1.39	1.29	1.21	1.13	1.05	0.98
750.00	2.71	2.59	2.45	2.31	2.16	2.04	1.93	1.81	1.72	1.61	1.51	1.41	1.30	1.23	1.15	1.07	0.99
790.00	2.74	2.63	2.49	2.35	2.21	2.08	1.97	1.86	1.75	1.63	1.53	1.44	1.33	1.24	1.16	1.08	1.00
830.00	2.77	2.66	2.53	2.39	2.24	2.11	1.99	1.88	1.79	1.67	1.56	1.46	1.35	1.25	1.17	1.09	1.01

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0420_WorstPassingOSCTableB1

Description: This table is a 9x17 table of WorstPassing (e.g. 120k) OSC times for catalyst Bank 1. The axis' for this table include the average airflow and the catalyst temperature. After OSC is measured for a specific temp and airflow, the WorstPassing OSC value is found within this table for the measured temp and airflow and is used along with the OSC_TimeRaw (and the BestFailing OSC value) to calculate the Normalized Ratio for that specific test. The values in this table are based on the measured OSC for the WPA part across the temp and airflow range.

Notes: KtCATD_t_1_OSC_WorstPassing - Used for P0420 norm ratio calculation

y/x	7.00	7.75	8.50	9.25	10.00	10.75	11.50	12.25	13.00	13.75	14.50	15.25	16.00	16.75	17.50	18.25	19.00
510.00	2.61	2.49	2.37	2.25	2.14	2.04	1.95	1.85	1.75	1.66	1.55	1.46	1.38	1.30	1.23	1.18	1.12
550.00	2.67	2.55	2.43	2.30	2.18	2.08	1.98	1.90	1.79	1.70	1.59	1.50	1.42	1.35	1.28	1.21	1.15
590.00	2.74	2.60	2.48	2.34	2.22	2.11	2.02	1.93	1.83	1.74	1.64	1.54	1.46	1.38	1.31	1.24	1.18
630.00	2.81	2.66	2.54	2.39	2.27	2.16	2.07	1.98	1.88	1.80	1.69	1.59	1.51	1.43	1.35	1.28	1.21
670.00	2.87	2.72	2.59	2.44	2.31	2.20	2.11	2.02	1.93	1.84	1.74	1.63	1.54	1.46	1.38	1.30	1.24
710.00	2.90	2.77	2.63	2.48	2.36	2.26	2.16	2.07	1.98	1.89	1.78	1.66	1.57	1.49	1.40	1.34	1.27
750.00	2.95	2.81	2.67	2.52	2.40	2.30	2.21	2.12	2.02	1.92	1.81	1.69	1.60	1.52	1.42	1.36	1.30
790.00	2.99	2.86	2.70	2.56	2.45	2.33	2.26	2.16	2.06	1.97	1.84	1.72	1.63	1.55	1.45	1.39	1.33
830.00	3.02	2.90	2.75	2.61	2.49	2.38	2.29	2.19	2.10	1.99	1.87	1.75	1.66	1.57	1.49	1.42	1.36

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0430_BestFailingOSCTableB2

Description: This table is a 9x17 table of baseline Best Failing (e.g. threshold converter) OSC times for catalyst Bank 2. The axis' for this table include the average airflow and the catalyst temperature. After OSC is measured for a specific temp and airflow, the BestFailing OSC value is found within this table for the measured temp and airflow and is used along with the OSC_TimeRaw (and the WorstPassing value) to calculate the Normalized Ratio for that specific test. The values in this table are based on the measured OSC for the identified BPU converter that is used for MIL illumination across the specific temp and airflow range for a given program.

Notes: KtCATD_t_2_OSC_BestFailing - Used for P0430 norm ratio calculation

y/x	7.00	7.75	8.50	9.25	10.00	10.75	11.50	12.25	13.00	13.75	14.50	15.25	16.00	16.75	17.50	18.25	19.00
510.00	2.29	2.19	2.06	1.92	1.79	1.66	1.52	1.41	1.33	1.27	1.21	1.14	1.06	0.99	0.94	0.90	0.85
550.00	2.43	2.31	2.19	2.04	1.89	1.75	1.61	1.50	1.42	1.33	1.25	1.18	1.10	1.05	0.98	0.93	0.89
590.00	2.54	2.43	2.28	2.13	1.96	1.82	1.70	1.59	1.50	1.41	1.33	1.25	1.17	1.10	1.04	0.97	0.92
630.00	2.61	2.49	2.33	2.17	2.03	1.89	1.78	1.67	1.57	1.49	1.39	1.30	1.22	1.14	1.07	1.02	0.96
670.00	2.64	2.52	2.38	2.23	2.08	1.95	1.83	1.73	1.64	1.54	1.44	1.35	1.26	1.18	1.10	1.04	0.96
710.00	2.67	2.55	2.41	2.26	2.12	1.99	1.88	1.77	1.68	1.58	1.48	1.39	1.29	1.21	1.13	1.05	0.98
750.00	2.71	2.59	2.45	2.31	2.16	2.04	1.93	1.81	1.72	1.61	1.51	1.41	1.30	1.23	1.15	1.07	0.99
790.00	2.74	2.63	2.49	2.35	2.21	2.08	1.97	1.86	1.75	1.63	1.53	1.44	1.33	1.24	1.16	1.08	1.00
830.00	2.77	2.66	2.53	2.39	2.24	2.11	1.99	1.88	1.79	1.67	1.56	1.46	1.35	1.25	1.17	1.09	1.01

14 OBDG12 ECM Supporting Tables

Initial Supporting table - P0430_WorstPassingOSCTableB2

Description: This table is a 9x17 table of WorstPassing (e.g. 120k) OSC times for catalyst Bank 2. The axis' for this table include the average airflow and the catalyst temperature. After OSC is measured for a specific temp and airflow, the WorstPassing OSC value is found within this table for the measured temp and airflow and is used along with the OSC_TimeRaw (and the BestFailing OSC value) to calculate the Normalized Ratio for that specific test. The values in this table are based on the measured OSC for the WPA part across the temp and airflow range.

Notes: KtCATD_t_2_OSC_WorstPassing - Used for P0430 norm ratio calculation

y/x	7.00	7.75	8.50	9.25	10.00	10.75	11.50	12.25	13.00	13.75	14.50	15.25	16.00	16.75	17.50	18.25	19.00
510.00	2.61	2.49	2.37	2.25	2.14	2.04	1.95	1.85	1.75	1.66	1.55	1.46	1.38	1.30	1.23	1.18	1.12
550.00	2.67	2.55	2.43	2.30	2.18	2.08	1.98	1.90	1.79	1.70	1.59	1.50	1.42	1.35	1.28	1.21	1.15
590.00	2.74	2.60	2.48	2.34	2.22	2.11	2.02	1.93	1.83	1.74	1.64	1.54	1.46	1.38	1.31	1.24	1.18
630.00	2.81	2.66	2.54	2.39	2.27	2.16	2.07	1.98	1.88	1.80	1.69	1.59	1.51	1.43	1.35	1.28	1.21
670.00	2.87	2.72	2.59	2.44	2.31	2.20	2.11	2.02	1.93	1.84	1.74	1.63	1.54	1.46	1.38	1.30	1.24
710.00	2.90	2.77	2.63	2.48	2.36	2.26	2.16	2.07	1.98	1.89	1.78	1.66	1.57	1.49	1.40	1.34	1.27
750.00	2.95	2.81	2.67	2.52	2.40	2.30	2.21	2.12	2.02	1.92	1.81	1.69	1.60	1.52	1.42	1.36	1.30
790.00	2.99	2.86	2.70	2.56	2.45	2.33	2.26	2.16	2.06	1.97	1.84	1.72	1.63	1.55	1.45	1.39	1.33
830.00	3.02	2.90	2.75	2.61	2.49	2.38	2.29	2.19	2.10	1.99	1.87	1.75	1.66	1.57	1.49	1.42	1.36

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

Bundle Name: 5VoltReferenceA_FA
P0641
Bundle Name: 5VoltReferenceB_FA
P0651
Bundle Name: 5VoltReferenceMAP_OOR_Fit
P0697
Bundle Name: A/F Imbalance Bank1
P219A
Bundle Name: A/F Imbalance Bank2
P219B
Bundle Name: AAP3_SnsrCktFA
P222C, P222D
Bundle Name: AAP3_SnsrCktFP
P222C, P222D
Bundle Name: AccCktLo_FA
P2537
Bundle Name: AcceleratorPedalFailure
P2122, P2123, P2127, P2128, P2138, P0697, P06A3
Bundle Name: ACCMLostComm
U016B
Bundle Name: ACFailedOnSD
See ACCM Document
Bundle Name: ACHighSidePressSnsrCktFA
P0532, P0533
Bundle Name: ACThrmlRefrigSpdVld
See ACCM Document
Bundle Name: AfterThrottlePressTFTKO
Naturally Aspirated or Turbocharged: P0106, P0107, P0108. Supercharged: P012B, P012C, P012D.
Bundle Name: AfterThrottlePressureFA
Naturally Aspirated or Turbocharged: P0106, P0107, P0108. Supercharged: P012B, P012C, P012D.
Bundle Name: AfterThrottleVacuumTFTKO
Naturally Aspirated or Turbocharged: P0106, P0107, P0108. Supercharged: P012B, P012C, P012D.
Bundle Name: AIR System FA
P0411, P2440, P2444
Bundle Name: AIRPumpControlCircuit FA
P0418, P2257, P2258
Bundle Name: AIRSystemPressureSensor FA
P2430, P2431, P2432, P2433, P2435, P2436, P2437, P2438

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

Bundle Name: AIRValveControlCircuit FA

P0412, P041F, P044F

Bundle Name: AmbPresSnsr2_CktFA

P222C, P222D

Bundle Name: AnyCamPhaser_FA

P0010, P0011, P0013, P0014, P0020, P0021, P0023, P0024, P2088, P2089, P2090, P2091, P2092, P2093, P2094, P2095

Bundle Name: AnyCamPhaser_TFTKO

P0010, P0011, P0013, P0014, P0020, P0021, P0023, P0024, P2088, P2089, P2090, P2091, P2092, P2093, P2094, P2095

Bundle Name: BrakeBoosterSensorFA

P0556, P0557, P0558

Bundle Name: BrakeBoosterVacuumValid

P0556, P0557, P0558

Bundle Name: BSTR_b_IC_Pmp_EffPerfTFTKO

P026A

Bundle Name: CamLctnExhFA

P0017, P0019, P0365, P0366, P0390, P0391

Bundle Name: CamLctnIntFA

P0016, P0018, P0340, P0341, P0345, P0346

Bundle Name: CamSensor_FA

P0016, P0017, P0018, P0019, P0340, P0341, P0345, P0346, P0365, P0366, P0390, P0391

Bundle Name: CamSensor_TFTKO

P0016, P0017, P0018, P0019, P0340, P0341, P0345, P0346, P0365, P0366, P0390, P0391

Bundle Name: CamSensorAnyLctnTFTKO

P0016, P0017, P0018, P0019, P0340, P0341, P0345, P0346, P0365, P0366, P0390, P0391

Bundle Name: CamSensorAnyLocationFA

P0016, P0017, P0018, P0019, P0340, P0341, P0345, P0346, P0365, P0366, P0390, P0391

Bundle Name: CamSensorFA

P0016, P0017, P0018, P0019, P0340, P0341, P0345, P0346, P0365, P0366, P0390, P0391

Bundle Name: CamSensorTFTKO

P0016, P0017, P0018, P0019, P0340, P0341, P0345, P0346, P0365, P0366, P0390, P0391

Bundle Name: CatalystSysEfficiencyLoB1_FA

P0420

Bundle Name: CatalystSysEfficiencyLoB2_FA

P0430

Bundle Name: ClutchPstnSnsr FA

P0806, P0807, P0808

Bundle Name: ClutchPstnSnsrCktHi FA

P0808

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

Bundle Name: ClutchPstnSnsrCktLo_FA
P0807
Bundle Name: ClutchPstnSnsrNotLearned
P080A
Bundle Name: CommBusAOff_VICM_FA
U0073
Bundle Name: CommBusBOff_VICM_FA
U0074
Bundle Name: CoolingFanSpeedTooHigh_FA
P0495
Bundle Name: CrankCamCorrelationTFTKO
P0016, P0017, P0018, P0019
Bundle Name: CrankExhaustCamCorrelationFA
P0017, P0019
Bundle Name: CrankExhaustCamCorrFA
P0017, P0019
Bundle Name: CrankIntakeCamCorrelationFA
P0016, P0018
Bundle Name: CrankIntakeCamCorrFA
P0016, P0018
Bundle Name: CrankSensor_FA
P0335, P0336
Bundle Name: CrankSensor_TFTKO
P0335, P0336
Bundle Name: CrankSensorFA
P0335, P0336
Bundle Name: CrankSensorFaultActive
P0335, P0336
Bundle Name: CrankSensorTestFailedTKO
P0335, P0336
Bundle Name: CrankSensorTFTKO
P0335, P0336
Bundle Name: CylDeacDriverFault
P3401, P03403, P03404, P3409, P03411, P03412, P3417, P3419, P3420, P3425, P3427, P3428, P3433, P3435, P3436, P3441, P3443, P3444, P3449, P3451, P3452, P3457, P3459, P3460
Bundle Name: CylDeacSystemTFTKO
P3400
Bundle Name: ECT_Sensor_Ckt_FA

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

P0117, P0118, P0119

Bundle Name: ECT_Sensor_Ckt_FP

P0117, P0118

Bundle Name: ECT_Sensor_Ckt_High_FP

P0118

Bundle Name: ECT_Sensor_Ckt_Low_FP

P0117

Bundle Name: ECT_Sensor_Ckt_TFTKO

P0117, P0118, P0119

Bundle Name: ECT_Sensor_Ckt_TPTKO

P0117, P0118, P0019

Bundle Name: ECT_Sensor_DefaultDetected

P0117, P0118, P0116, P0125

Bundle Name: ECT_Sensor_FA

P0117, P0118, P0116, P0125, P0128

Bundle Name: ECT_Sensor_Perf_FA

P0116

Bundle Name: ECT_Sensor_TFTKO

P0117, P0118, P0116, P0125, P0119

Bundle Name: EGRValve_FP

P0405, P0406, P042E

Bundle Name: EGRValveCircuit_FA

P0403, P0404, P0405, P0406

Bundle Name: EGRValveCircuit_TFTKO

P0403, P0404, P0405, P0406

Bundle Name: EGRValvePerformance_FA

P0401, P042E

Bundle Name: EGRValvePerformance_TFTKO

P0401, P042E

Bundle Name: ELCP_PumpCircuit_FA

P2400, P2401, P2402

Bundle Name: ELCP_SwitchCircuit_FA

P2418, P2419, P2420

Bundle Name: ELCP_Circuit_FA

P24BA, P24BB

Bundle Name: EngineMetalOvertempActive

P1258

Bundle Name: EngineMisfireDetected_FA

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308

Bundle Name: EngineMisfireDetected_TFTKO

P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308

Bundle Name: EngineModeNotRunTimer_FA

P2610

Bundle Name: EngineModeNotRunTimerError

P2610

Bundle Name: EnginePowerLimited

P0068, P00C8, P00C9, P00CA, P0090, P0091, P0092, P0122, P0123, P0191, P0192, P0193, P0222, P0223, P0601, P0604, P0606, P0697, P06A3, P06DB, P06DE, P0A1D, P1104, P127A, P127C, P127D, P15F2, P160D, P160E, P1682, P16A0, P16A1, P16A2, P16F3, P2100, P2101, P2102, P2103, P2122, P2123, P2127, P2128, P2135, P2138, P215B, P2176, P228C, P228D, U0073, U0074, U0293, U1817

Bundle Name: EngineTorqueEstInaccurate

EngineMisfireDetected_FA, FuelInjectorCircuit_FA, FuelInjectorCircuit_TFTKO, FuelTrimSystemB1_FA, FuelTrimSystemB2_FA, MAF_SensorTFTKO, MAP_SensorTFTKO, EGRValuePerforamnce_FA

Bundle Name: EngModeNotRunTmErr

P2610

Bundle Name: EngOilModeledTempValid

ECT_Sensor_FA, IAT_SensorCircuitFA

Bundle Name: EngOilPressureSensorCktFA

P0522, P0523

Bundle Name: EngOilPressureSensorFA

P0521, P0522, P0523

Bundle Name: EngOilTempFA

EngOilTempSensorCircuitFA, EngOilModeledTempValid, P16F3

EngOilTempFA - Other Definitions:

P16F3 with GetXOYR_b_SecurityFlt(CeXOYR_e_EOTR_SecurityFlt)

Bundle Name: EngOilTempSensorCircuitFA

P0197, P0198

Bundle Name: Ethanol Composition Sensor FA

P0178, P0179, P2269

Bundle Name: EvapEmissionSystem_FA

P0455, P0446

Bundle Name: EvapExcessPurgePsbl_FA

ELCP sealed/vented fuel system, P0442, P0455, P0458 OR Conventional fuel system, P0442, P0455, P0458, P0496

Bundle Name: EvapFlowDuringNonPurge_FA

P0496

Bundle Name: EvapPurgeSolenoidCircuit_FA

P0443, P0458, P0459

Bundle Name: EvapReducedPurgePsbl_FA

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

ELCP sealed/vented fuel system, P0443, P0446, P0449, P0459, P0497, P0499, P1463, P2419, P2422 OR Conventional fuel system, P0443, P0446, P0455, P0459, P0498

Bundle Name: EvapSmallLeak_FA

P0442

Bundle Name: EvapVentSolenoidCircuit_FA

P0449, P0498, P0499

Bundle Name: ExhaustCamSensor_FA

P0017, P0019, P0365, P0366, P0390, P0391

Bundle Name: ExhaustCamSensor_TFTKO

P0017, P0019, P0365, P0366, P0390, P0391

Bundle Name: ExhaustCamSensorFA

P0017, P0019, P0365, P0366, P0390, P0391

Bundle Name: ExhaustCamSensorTFTKO

P0017, P0019, P0365, P0366, P0390, P0391

Bundle Name: FanOutputDriver_FA

P0480, P0481, P0482, P0691, P0692, P0693, P0694, P0695, P0696, P1485 (EREV), P1486 (EREV), P1487 (EREV)

Bundle Name: FHPD_b_HPC_PresErrNeg_FA

P228D

Bundle Name: FHPD_b_HPC_PresErrNeg_TFTKO

P228D

Bundle Name: FHPD_b_HPC_PresErrPos_FA

P228C

Bundle Name: FHPD_b_HPC_PresErrPos_TFTKO

P228C

Bundle Name: FHPD_b_HPC_Windup_TFTKO

P0089

Bundle Name: FHPD_b_HPC_Windup_FA

P0089

Bundle Name: FHPD_b_PumpCurr_FA

P163A

Bundle Name: FHPD_b_PumpCurr_TFTKO

P163A

Bundle Name: FHPR_b_FRP_SnsrCkt_FA

P0192, P0193, P127C, P127D

Bundle Name: FHPR_b_FRP_SnsrCkt_TFTKO

P0192, P0193, , P127C, P127D

Bundle Name: FHPR_b_FRP_SnsrPerfDiag_FA

P0191, P127A

Bundle Name: FHPR_b_FRP_SnsrPerfDiag_TFTKO

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

P0191, P127A
Bundle Name: FHPR_b_PumpCkt_FA
P0090, P0091, P0092, P00C8, P00C9, P00CA
Bundle Name: FHPR_b_PumpCkt_TFTKO
P0090, P0091, P0092, P00C8, P00C9, P00CA
Bundle Name: FourWheelDriveLowStateInvalid
P2771
Bundle Name: FTP_SensorCircuit_FA
P0452, P0453
Bundle Name: FuelInjectorCircuit_FA
PFI: P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0261, P0264, P0267, P0270, P0273, P0276, P0279, P0282, P0262, P0265, P0268, P0271, P0274, P0277, P0280, P0283 SIDI: P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0261, P0264, P0267, P0270, P0273, P0276, P0279, P0282, P0262, P0265, P0268, P0271, P0274, P0277, P0280, P0283, P2147, P2150, P2153, P2156, P216B, P216E, P217B, P217E, P2148, P2151, P2154, P2157, P216C, P216F, P217C, P217F, P1248, P1249, P124A, P124B, P124C, P124D, P124E, P124F
Bundle Name: FuelInjectorCircuit_TFTKO
PFI: P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0261, P0264, P0267, P0270, P0273, P0276, P0279, P0282, P0262, P0265, P0268, P0271, P0274, P0277, P0280, P0283 SIDI: P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0261, P0264, P0267, P0270, P0273, P0276, P0279, P0282, P0262, P0265, P0268, P0271, P0274, P0277, P0280, P0283, P2147, P2150, P2153, P2156, P216B, P216E, P217B, P217E, P2148, P2151, P2154, P2157, P216C, P216F, P217C, P217F, P1248, P1249, P124A, P124B, P124C, P124D, P124E, P124F
Bundle Name: FuelLevelDataFault
P0461, P0462, P0463, P2066, P2067, P2068
Bundle Name: FuelTankPressureSnsrCkt_FA
P0452, P0453
Bundle Name: HumidityFA
P0097, P0098, P11C2, P11C3, P2227, P2228, P2229, P2230
Bundle Name: HumTempSnsrCktFA
P0097, P0098
Bundle Name: HumTempSnsrCktFP
P0097, P0098
Bundle Name: HumTempSnsrFA
P0096, P0097, P0098, P0099
Bundle Name: IAC_SystemRPM_FA
P0506, P0507
Bundle Name: IAT_ContCorrFA
P2199
Bundle Name: IAT_SensorCircuitFA
P0112, P0113
Bundle Name: IAT_SensorCircuitFP
P0112, P0113

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

Bundle Name: IAT_SensorCircuitTFTKO

P0112, P0113

Bundle Name: IAT_SensorFA

P0111, P0112, P0113, P0114

Bundle Name: IAT_SensorTFTKO

P0111, P0112, P0113, P0114

Bundle Name: IgnitionOffTimer_FA

P2610

Bundle Name: IgnitionOffTimeValid

P2610

Bundle Name: IgnitionOutputDriver_FA

P0351, P0352, P0353, P0354, P0355, P0356, P0357, P0358, P2300, P2301, P2303, P2304, P2306, P2307, P2309, P2310, P2312, P2313, P2315, P2316, P2318, P2319, P2321, P2322

Bundle Name: IntakeCamSensor_FA

P0016, P0018, P0340, P0341, P0345, P0346

Bundle Name: IntakeCamSensor_TFTKO

P0016, P0018, P0340, P0341, P0345, P0346

Bundle Name: IntakeCamSensorFA

P0016, P0018, P0340, P0341, P0345, P0346

Bundle Name: IntakeCamSensorTFTKO

P0016, P0018, P0340, P0341, P0345, P0346

Bundle Name: IntkCamPhaser_FA

P0010, P0011, P0020, P0021, P2088, P2089, P2092, P2093

Bundle Name: KS_Ckt_Perf_B1B2_FA

P0324, P0325, P0326, P0327, P0328, P0330, P0332, P0333, P06B6, P06B7

Bundle Name: LostCommBCM_FA

U0140

Bundle Name: LostCommBusB_VICM_FA

U182D

Bundle Name: LowFuelConditionDiagnostic

LowFuelConditionDiagnostic - Other Definitions:

Flag set to TRUE if the fuel level < 10.0 % AND

No Active DTCs: FuelLevelDataFault, P0462, P0463 for at least 30.0 seconds

Bundle Name: MAF_SensorPerfFA

P0101

Bundle Name: MAF_SensorPerfTFTKO

P0101

Bundle Name: MAF_Snsr1_FA

14 OBDG12 ECM Supporting Tables

Fault Bundle Definitions

P0101, P0102, P0103

Bundle Name: MAF_Snsr2_FA

P010B, P010C, P010D

Bundle Name: MAP_EngineVacuumStatus

P0106, P0107, P0108 Fault Active OR P0107, P0108 Fault Pending

Bundle Name: MAP_SensorCircuitFA

P0107, P0108

Bundle Name: MAP_SensorCircuitFP

P0107, P0108

Bundle Name: MAP_SensorFA

P0106, P0107, P0108

Bundle Name: MAP_SensorPerfFA

P0106

Bundle Name: MAP_SensorPerfTFTKO

P0106

Bundle Name: MAP_SensorTFTKO

P0106, P0107, P0108

Bundle Name: MnfdTempSensorCktFA

Turbocharged or Supercharged, with Humidity sensor: P112C, P112D. Turbocharged or Supercharged, without Humidity sensor: P0097, P0098. Naturally Aspirated: P0112, P0113.

Bundle Name: MnfdTempSensorCktFP

Turbocharged or Supercharged, with Humidity sensor: P112C, P112D. Turbocharged or Supercharged, without Humidity sensor: P0097, P0098. Naturally Aspirated: P0112, P0113.

Bundle Name: MnfdTempSensorCktTFTKO

Turbocharged or Supercharged, with Humidity sensor: P112C, P112D. Turbocharged or Supercharged, without Humidity sensor: P0097, P0098. Naturally Aspirated: P0112, P0113.

Bundle Name: MnfdTempSensorFA

Turbocharged or Supercharged, with Humidity sensor: P112B, P112C, P112D, P112E. Turbocharged or Supercharged, without Humidity sensor: P0096, P0097, P0098, P0099. Naturally Aspirated: P0111, P0112, P0113, P0114.

Bundle Name: MnfdTempSensorTFTKO

Turbocharged or Supercharged, with Humidity sensor: P112B, P112C, P112D, P112E. Turbocharged or Supercharged, without Humidity sensor: P0096, P0097, P0098, P0099. Naturally Aspirated: P0111, P0112, P0113, P0114.

Bundle Name: ModuleOffTime_FA

P2610

Bundle Name: ModuleOffTimeErr

P2610

Bundle Name: OAT_AmbientFilteredFA

ECM OAT: P0071, P0072, P0073, P0074, EngModeNotRunTmErr, VehicleSpeedSensor_FA, IAT_SensorFA, ECT_Sensor_DefaultDetected, MAF_SensorFA. VIMC OAT: P0072, P0073, EngModeNotRunTmErr, VehicleSpeedSensor_FA, ECT_Sensor_DefaultDetected. IAT-Based OAT: not applicable. All other cases: not applicable.

Bundle Name: OAT_AmbientSensorFA

ECM OAT: P0071, P0072, P0073, P0074. VIMC OAT: P0071, P0072, P0073, EngModeNotRunTmErr, VehicleSpeedSensor_FA, ECT_Sensor_DefaultDetected. IAT-Based OAT: not applicable. All other cases: not applicable.

14 OBDG12 ECM Supporting Tables

Fault Bundle Definitions

Bundle Name: OAT_EstAmbTemp_FA

ELCP sealed/vented fuel system, P0071, P0072, P0073, P0502, P0503, P0722, P0723 OR Conventional fuel system, P0071, P0072, P0073, P0074, P2610

Bundle Name: OAT_PtEstFiltFA

ECM OAT: P0071, P0072, P0073, P0074, EngModeNotRunTmErr, VehicleSpeedSensor_FA, IAT_SensorFA, ECT_Sensor_DefaultDetected, MAF_SensorFA. VIMC OAT: P0072, P0073, EngModeNotRunTmErr, VehicleSpeedSensor_FA, ECT_Sensor_DefaultDetected. IAT-Based OAT: VehicleSpeedSensor_FA, IAT_SensorFA, MAF_SensorFA. All other cases: EngModeNotRunTmErr, VehicleSpeedSensor_FA, IAT_SensorFA, ECT_Sensor_DefaultDetected.

Bundle Name: OAT_PtEstRawFA

ECM OAT: P0071, P0072, P0073, P0074. VIMC OAT: P0071, P0072, P0073, EngModeNotRunTmErr, VehicleSpeedSensor_FA, ECT_Sensor_DefaultDetected. IAT-Based OAT: IAT_SensorFA. All other cases: IAT_SensorFA, ECT_Sensor_DefaultDetected.

Bundle Name: OilPmpCktFA

P06DA, P06DB, P06DC

OilPmpCktFA - Other Definitions:

Output Driver Codes

Bundle Name: OilPmpFA

P06DA, P06DB, P06DC, P06DD, P06DE

OilPmpFA - Other Definitions:

FA only for Output Driver and rationality

Bundle Name: OilPmpStuckHigh

P06DA, P06DB, P06DD

OilPmpStuckHigh - Other Definitions:

TFTKO and FA

Bundle Name: OilPmpStuckLow

P06DC, P06DE

OilPmpStuckLow - Other Definitions:

TFTKO and FA

Bundle Name: OilPmpTFTKO

P06DA, P06DB, P06DC, P06DD, P06DE

OilPmpTFTKO - Other Definitions:

TFTKO only for Output Driver and rationality

Bundle Name: PostCatFuelTrimHiB1

P2097

Bundle Name: PostCatFuelTrimHiB2

P2099

Bundle Name: PostCatFuelTrimLoB1

P2096

Bundle Name: PostCatFuelTrimLoB2

P2098

Bundle Name: PowertrainRelayStateOn_FA

P0685, P0686, P0687

Bundle Name: PPS1_OutOfRange

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

P2122, P2123
Bundle Name: PPS1_OutOfRange_Composite
P2122, P2123, P06A3
Bundle Name: PPS2_OutOfRange
P2127, P2128
Bundle Name: PPS2_OutOfRange_Composite
P2127, P2128, P0697
Bundle Name: SCIAP_SensorCircuitFA
P012C, P012D
Bundle Name: SCIAP_SensorCircuitFP
P012C, P012D
Bundle Name: SCIAP_SensorFA
P012B, P012C, P012D
Bundle Name: SCIAP_SensorPerfFA
P012B
Bundle Name: SCIAP_SensorPerfTFTKO
P012B
Bundle Name: SCIAP_SensorTFTKO
P012B, P012C, P012D
Bundle Name: SuperchargerBypassValveFA
P2261
Bundle Name: SystemVoltageHigh_FA
P0563
Bundle Name: SystemVoltageLow_FA
P0562
Bundle Name: TCM_EngSpdReqCkt
P150C
Bundle Name: THMR_AHV_FA
P2681, P26A3, P26A6, P26A7, P26A9
Bundle Name: THMR_AWP_AuxPumpFA
B2920, B2923, B2922
Bundle Name: THMR_ECT_Sensor_Ckt_FA
P0116, P0117, P0118, P00B6
Bundle Name: THMR_Insuff_Flow_FA
P00B7
Bundle Name: THMR_RCT_Sensor_Ckt_FA
P00B3, P00B4
Bundle Name: THMR_SWP_Control_FA

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

P261D, P261A, P261C

Bundle Name: THMR_SWP_FlowStuckOn_FA

P261A, P261D, P261E

Bundle Name: THMR_SWP_NoFlow_FA

P261B, P261C

Bundle Name: THMR_Therm_Control_FA

P0597, P0598, P0599

Bundle Name: ThrotTempSensorFA

Turbocharged or Supercharged, with Humidity sensor: P112B, P112C, P112D, P112E. Turbocharged or Supercharged, without Humidity sensor: P0096, P0097, P0098, P0099. Naturally Aspirated: P0111, P0112, P0113, P0114.

Bundle Name: ThrotTempSensorTFTKO

Turbocharged or Supercharged, with Humidity sensor: P112B, P112C, P112D, P112E. Turbocharged or Supercharged, without Humidity sensor: P0096, P0097, P0098, P0099. Naturally Aspirated: P0111, P0112, P0113, P0114.

Bundle Name: ThrottlePositionSnsrPerfFA

P0121

Bundle Name: ThrottlePositionSnsrPerfTFTKO

P0121

Bundle Name: TIAP_SensorPerfFA

P0236

Bundle Name: TPS_FA

P0122, P0123, P0222, P0223, P2135

Bundle Name: TPS_FaultPending

P0122, P0123, P0222, P0223, P2135

Bundle Name: TPS_Performance_FA

P0068, P0121, P1104, P2100, P2101, P2102, P2103

Bundle Name: TPS_Performance_TFTKO

P0068, P0121, P1104, P2100, P2101, P2102, P2103

Bundle Name: TPS_TFTKO

P0122, P0123, P0222, P0223, P2135

Bundle Name: TPS_ThrottleAuthorityDefaulted

P0068, P0122, P0123, P0222, P0223, P16F3, P1104, P2100, P2101, P2102, P2103, P2135

Bundle Name: TPS1_OutOfRange_Composite

P0122, P0123, P06A3

Bundle Name: TPS2_OutOfRange_Composite

P0222, P0223, P06A3

Bundle Name: Trans Output Rotations Rolling Count Validity

P0722, P0723, P077C, P077D

Bundle Name: TransActualGearValidity

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

P182E, P1915

Bundle Name: Transfer Pump is Commanded On

Transfer Pump is Commanded On - Other Definitions:

Fuel Volume in Primary Fuel Tank < 0.0 liters AND
 Fuel Volume in Secondary Fuel Tank ≥ 0.0 liters AND
 Transfer Pump on Time < P0461, P2066, P2636: Transfer Pump Enable (see supporting table for numeric value) AND
 Transfer Pump had been Off for at least 0.0 seconds AND
 Evap Diagnostic (Purge Valve Leak Test, Large Leak Test, and Waiting for Purge) is not running AND
 Engine Running

Bundle Name: Transmission Actual Gear Validity

P182E, P1915

Bundle Name: Transmission Engaged State Validity

P182E, P1915

Bundle Name: Transmission Estimated Gear Validity

P182E, P1915

Bundle Name: Transmission Gear Ratio Validity

P0716, P0717, P0722, P0723, P077C, P077D, P07BF, P07C0

Bundle Name: Transmission Gear Selector Position Validity

P182E, P1915

Bundle Name: Transmission Oil Temperature Validity

P0667, P0668, P0669, P0711, P0712, P0713

Bundle Name: Transmission Output Shaft Angular Velocity Validity

P0722, P0723, P077C, P077D

Bundle Name: Transmission Overall Actual Torque Ratio Validity

P0716, P0717, P0722, P0723, P077C, P077D, P07BF, P07C0, P182E, P1915

Bundle Name: Transmission Overall Estimated Torque Ratio Validity

P0716, P0717, P0722, P0723, P077C, P077D, P07BF, P07C0, P182E, P1915

Bundle Name: Transmission Shift Lever Position Validity

P182E, P1915

Bundle Name: Transmission Turbine Angular Velocity Validity

P0716, P0717, P07BF, P07C0

Bundle Name: TransmissionEngagedState_FA

P182E, P1915

Bundle Name: TransmissionGearDefaulted

P182E, P1915

Bundle Name: TransmissionOutputRotationalStatusValidity

P0722, P0723, P077C, P077D

Bundle Name: TransmissionRatioControlSystemFault

**14 OBDG12 ECM Supporting Tables
Fault Bundle Definitions**

P0751, P0752, P0756, P0757, P0973, P0974, P0976, P0977

Bundle Name: VCER_TorqueSecurity

P16F3

VCER_TorqueSecurity - Other Definitions:

P16F3 with GetXOYR_b_SecurityFlt(CeXOYR_e_AFM_PreloadAreaFlt, CeXOYR_e_AFM_PreloadTimerFlt, CeXOYR_e_AFM_DualPreloadAreaFlt, CeXOYR_e_CDAR_SecurityFlt)

Bundle Name: VehicleSpeedSensor_FA

P0502, P0503, P0722, P0723

Bundle Name: VehicleSpeedSensorError

P0502, P0503, P0722, P0723

Bundle Name: VentCircuit_FA

ELCP sealed/vented fuel system, P0449, P0498, P0499

Bundle Name: VICM_WakeupDiag_FA

P06E4

Bundle Name: VICM_WakeupDiag_TFTKO

P06E4

Bundle Name: VITR_LVT_FltBndl

P058B, P058D, P118C, P118D