14 OBDG08 ECM Summary Tables (Initial DTCs)

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	> 11.00 Volts	20 failures out of 25 samples250 ms / sample, continuous	Type B, 2 Trips

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. (**CamPosErrorLimIc1**)	DTC's are NOT active: P0010, IntakeCamSensorTFTKO CrankSensorTFTKO CrankIntakeCamCorrelationFA.	System Voltage > 11.00 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 (**CamPosErrorLimIc1**) or have both > 23.00 deg. (**PerfMaxIc1**). Desired cam position cannot vary more than 7.50 Cam Deg for at least 3.35 sec. (**StablePositionTimeIc1**)	100.00 failures out of 1,000.00 samples100 ms / sample	Type B, 2 Trips

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 < 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

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 controllers P0031 may also set

14 OBDG08 ECM Summary Tables (Initial DTCs)

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: ≤ 0.5 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 controllers P0030 may also set

14 OBDG08 ECM Summary Tables (Initial DTCs)

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: ≤ 0.5 Ω 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

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 controllers P0037 may also set

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: ≤ 0.5 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 controllers P0036 may also set

14 OBDG08 ECM Summary Tables (Initial DTCs)

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: ≤ 0.5 Ω 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

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 controllers P0051 may also set

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: ≤ 0.5 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 controllers P0050 may also set

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: ≤ 0.5 Ω 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

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	3.1 < Ω < 8.4	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 ºC > 28,800 seconds -30.0 < ºC < 45.0 < 32.0 volts < 0.04 seconds	Once per valid cold start	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	3.1 < Ω < 8.4	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 ºC > 28,800 seconds -30.0 < ºC < 45.0 < 32.0 volts < 0.04 seconds	Once per valid cold start	Type B, 2 Trips

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 controllers P0057 may also set

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: ≤ 0.5 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 controllers P0056 may also set

14 OBDG08 ECM Summary Tables (Initial DTCs)

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: ≤ 0.5 Ω 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

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	3.4 < Ω < 8.6	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 ºC > 28,800 seconds -30.0 < ºC < 45.0 < 32.0 volts < 0.09 seconds	Once per valid cold start	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	3.4 < Ω < 8.6	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 ºC > 28,800 seconds -30.0 < ºC < 45.0 < 32.0 volts < 0.09 seconds	Once per valid cold start	Type B, 2 Trips

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	Difference between MAP and estimated MAP exceeds threshold (kPa), or P0651 (5 Volt Ref), or P0107 (MAP circuit low), or P0108 (MAP circuit high) have failed this key cycle, then MAP portion of diagnostic fails Absolute difference between MAF and estimated MAF exceed threshold (grams/sec), or P0102 (MAF circuit low), or P0103 (MAF circuit hi) have failed this key cycle, or maximum MAF versus RPM (Table) is greater than or equal to maximum MAF versus battery voltage, then MAF portion of diagnostic fails	Table, f(TPS). See supporting tables: **Delta MAP Threshold f(TPS)** Table, f(TPS). See supporting tables: **Delta MAF Threshold f(TPS)** Table, f(RPM). See supporting tables: **Maximum MAF f (RPM)** Table, f(Volts). See supporting tables: **Maximum MAF f (Volts)**	Engine Speed	> 800 RPM Run/Crank voltage > 6.41	Continuously fail MAP and MAF portions of diagnostic for 0.1875 s Continuous in MAIN processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Outside Air Temperature (OAT) Sensor Circuit Performance	P0071	Detects an OAT sensor that has stuck in range by comparing to IAT when conditions are appropriate	OAT-to-IAT engine off equilibrium counter (see below for description of this counter) If IAT >= OAT: IAT - OAT If IAT < OAT: OAT - IAT The "OAT-to-IAT engine off equilibrium counter" is a counter that is incremented or decremented based on vehicle speed when the engine is off. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. The value that is added or subtracted to the counter every 100 msec is contained in table "**P0071_OAT_Performance_Drive_Equilibrium_Engine_Off**".	>= 300.0 counts > 15.0 deg C > 15.0 deg C	Time between current ignition cycle and the last time the engine was running Engine is not running Vehicle Speed Coolant Temperature - IAT IAT - Coolant Temperature No Active DTCs:	>= 28,800.0 seconds >= 15.5 MPH < 15.0 degrees C < 15.0 degrees C VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_DefaultDetected MAF_SensorFA EngModeNotRunTmErr	Executed every 100 msec	Type B, 2 Trips
			OAT-to-IAT engine running equilibrium counter (see below for description of this counter) If IAT >= OAT: IAT - OAT If IAT < OAT:	>= 300.0 counts > 15.0 deg C	Engine is running Vehicle Speed Engine air flow No Active DTCs:	>= 15.5 MPH >= 10.0 grams/second VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_DefaultDetected MAF_SensorFA	Executed every 100 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			OAT - IAT The "OAT-to-IAT engine running equilibrium counter" is a counter that is incremented or decremented based on vehicle speed and engine air flow when the engine is running. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. The value that is added or subtracted to the counter every 100 msec is contained in table "**P0071_OAT_Performance_Drive_Equilibrium_Engine_Running**".	> 15.0 deg C		EngModeNotRunTmErr		

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Outside Air Temperature (OAT) Sensor Circuit Low	P0072	Detects a continuous short to ground in the OAT signal circuit or the OAT sensor	Raw OAT Input	<= 52 Ohms (~150 deg C)	Continuous		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Outside Air Temperature (OAT) Sensor Circuit High	P0073	Detects a continuous open circuit in the OAT signal circuit or the OAT sensor	Raw OAT Input	>= 403,672 Ohms (~-60 deg C)	Continuous		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Outside Air Temperature (OAT) Sensor Intermittent In-Range	P0074	Detects a noisy or erratic OAT signal circuit or OAT sensor	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current OAT reading - OAT reading from 100 milliseconds previous)	> 100 DegC 25 consecutive OAT samples		Continuous	4 failures out of 5 samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module SIDI High Pressure Pump min/ max authority	P0089	This DTC Diagnoses pump control windup to its max or min authority	High Pressure Fuel Pump Delivery Angle High Pressure Fuel Pump Delivery Angle	>= 130 ° Or <= 0 °	Battery Voltage Low Side Fuel Pressure Engine Run Time Barometric Pressure Inlet Air Temp Fuel Temp Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) andCam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition	>= 11 Volts > 0.275 MPa >= KtFHPD_t_PumpCntrlEngRunThrsh (see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking >= 70.0 KPA >= -10.0 degC -10 <= Temp degC <= 100	Windup High - 750 failures out of 938 samples Windup Low - 750 failures out of 938 Samples	Type B, 2 Trips

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

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Pressure Pump Control Solenoid Enable Low Side Open Circuit	P0090	The DTC Diagnoses the High Pressure Pump Control Solenoid Enable Low Side Circuit for circuit faults.	Voltage low during driver off state indicates open circuit	Open Circuit: ≥ 200 K Ω impedance between signal and controller ground	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Pressure Pump Control Solenoid Enable Low Side Short to Ground	P0091	The DTC Diagnoses the High Pressure Pump Control Solenoid Enable Low Side Circuit for circuit faults.	Voltage low during driver off state indicates short-to-ground	Short to ground: ≤ 0.1 Amps between signal and controller ground	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Pressure Pump Cntrl Solenoid Enable Low Side Short to Power	P0092	The DTC Diagnoses the High Pressure Pump Control Solenoid Enable Low Side Circuit for circuit faults.	Voltage high during driver off state indicates short to power	Short to power: ≤ 1.1 or 15 Amps selectable thershold based on High pressure Pump .	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 2 Circuit Performance (applications with humidity sensor, but no manifold temperature sensor)	P0096	Detects an IAT2 sensor that has stuck in range by comparing to IAT and engine coolant temperature at startup	ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up ECT – Power Up IAT2) >= ABS(Power Up ECT – Power Up IAT)	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.00 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit 2 Low (applications with humidity)	P0097	Detects a continuous short to ground or open in the IAT 2 signal circuit	Raw IAT 2 Input	< 13 Hertz (~-60 deg C)	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.00 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit 2 High (applications with humidity)	P0098	Detects a continuous high frequency in the IAT 2 signal circuit	Raw IAT 2 Input	> 390 Hertz (~150 deg C)	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.00 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 2 Intermittent In-Range	P0099	Detects a noisy or erratic IAT 2 signal circuit or IAT 2 sensor	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT 2 reading - IAT 2 reading from 100 milliseconds previous)	> 100.00 DegC 10 consecutive IAT 2 samples	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.00 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Pressure Start Diagnostic	P00C6	The DTC Diagnoses the high side fuel pressure during engine cranking.	The ECM detects that the fuel pressure is not rising or has fallen beyond acceptable limits during engine cranking	Pressure Fall Test: High Side Fuel Rail Pressure <= Supporting Table KtFHPD_p_HPS_PressFallLoThrsh Pressure Rise Test: High Side Fuel Pressure < Supporting Table KtFHPC_p_HighPressStart	Low side feed fuel pressure Engine Run Time Run/Crank Voltage Engine Coolant For each engine start, only 1 diagnostic is performed. The pressure rise test will run if HIgh side fuel pressure is less than KtFHPC_p_HighPressStart, otherwise, the pressure fall diagnostic will run The pressure fall runs when the engine is cranking.	>= 0 KPA < = 0 sec > 8 Volts -100 <= °C <= 65 All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT, IAT2 and ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable	Pressure Fall Test: Injected cylinder events >= Supporting Table KtFHPD_Cnt_HPS_PressFallLoThrsh Pressure Rise Test: Time >= Supporting Table KtFHPC_t_HighPressStartTmout	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active		
					Barometric Pressure Inlet Air Temp	>= 70.0 KPA >= -10.0 DegC		

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Press Regulator Solenoid Supply Voltage Control High Side Circuit Open	P00C8	The DTC Diagnoses the Fuel Press Regulator Solenoid Supply Voltage Control Circuit for circuit faults.	Voltage High during driver off state indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Press Regulator Solenoid Supply Voltage Control High Side Circuit Short to ground	P00C9	The DTC Diagnoses the Fuel Press Regulator Solenoid Supply Voltage Control Circuit for circuit faults.	Voltage low during driver on state indicates short to ground	Short to ground: ≤ 1.1 or 15 Amps selectable thershold based on High pressure Pump.	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Press Regulator Solenoid Supply Voltage Control High Side Circuit Short to power	P00CA	The DTC Diagnoses the Fuel Press Regulator Solenoid Supply Voltage Control Circuit for circuit faults.	Voltage high during driver off state indicates short to power	Short to Power: ≤ 0.1 Amps between signal and controller power	Engine Speed Battery Voltage	>= 50 RPM >= 11 Volts Not in pump device control Enabled when a code clear is not active or not exiting device control	20 failures out of 40 samples 100 ms /sample Continuous	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Humidity Sensor Circuit Low	P00F4	Detects a continuous short to power in the Humidity Sensor circuit	Humidity Duty Cycle	<= 5.0 %	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.00 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Humidity Sensor Circuit High	P00F5	Detects a continuous open or short to low in the Humidity Sensor circuit	Humidity Duty Cycle	>= 95.0 %	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.00 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Humidity Sensor Circuit Intermittent	P00F6	Detects a noisy or erratic humidity sensor input	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current Humidity reading - Humidity reading from 100 milliseconds previous)	> 80 % 10 consecutive Humidity samples	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.00 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.00 seconds	Type B, 2 Trips

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	<= 250 kPa*(g/s) > 25.0 grams/sec > 22.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) No Active DTCs: No Pending DTCs:	>= 450 RPM <= 5,400 RPM >= -7 Deg C <= 129 Deg C >= -20 Deg C <= 129 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. MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	<= 850 Hertz (~ 1.43 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

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	>= 14,500 Hertz (~ 1233.0 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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Manifold Absolute Pressure Sensor Performance (naturally aspirated)	P0106	Determines if the MAP sensor is stuck within the normal operating range	Filtered Throttle Model Error AND ABS(Measured MAP – MAP Model 1) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	<= 250 kPa*(g/s) > 22.0 kPa > 22.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) No Active DTCs: No Pending DTCs:	>= 450 RPM <= 5,400 RPM >= -7 Deg C <= 129 Deg C >= -20 Deg C <= 129 Deg C >= 0.50 Filtered Throttle Model Error multiplied by **TPS Residual Weight Factor based on RPM** 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 MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP	Continuous Calculations are performed every 12.5 msec	Type B, 2 Trips
			Manifold Pressure OR	< 50.0 kPa	Time between current ignition cycle and the last		4 failures out of 5 samples	

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:	> 5.0 seconds EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP	1 sample every 12.5 msec	

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

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 humidity sensor, but no manifold temperature 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 Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.00 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	< 58 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

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	> 142,438 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

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

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.	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 1) ECT at power up > IAT at power up by an IAT based table lookup value (fast fail). 2) ECT at power up > IAT at power up by 19.3 Deg C and a block heater has not been detected. 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	See the table named: **P0116_Fail if power up ECT exceeds IAT by these values** in the Supporting tables section = False	No Active DTC's Non-volatile memory initization Test complete this trip Test aborted this trip IAT LowFuelCondition Diag ========== 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: 1a) Vehicle drive time 1b) Vehicle speed 1c) Additional Vehicle drive time is provided to 1a when Vehicle speed is below 1b as follows: 1d) IAT drops from power up IAT	VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA IgnitionOffTimeValid = Not occurred = False = False ≥ -7 ºC = False ========== > 19.3 ºC < 10.0 seconds ========== > 400 seconds > 14.9 MPH 0.00 times the seconds with vehicle speed below 1b ≥ 3.3 ºC	1 failure 500 msec/ sample Once per valid cold start	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					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	≥ 1 ºC Within ≤ 30 seconds ========== > 1800 seconds ≤ -7 ºC		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 (@ 150ºC)	< 45 Ohms			5 failures out of 6 samples 1 sec/ sample Continuous	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 (@ -60ºC)	> 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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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) postive step change is greater than calculated high limit OR 2) negitive 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 caluculated 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

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

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	> 250 kPa*(g/s) > 25.0 grams/sec <= 22.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) No Active DTCs: No Pending DTCs:	>= 450 RPM <= 5,400 RPM > -7 Deg C < 129 Deg C > -20 Deg C < 129 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. MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

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

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

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) (energy based "Deluxe" method	P0128	This DTC detects if the engine coolant temperature rises too slowly due to an ECT or Cooling system fault	Energy is accumulated after the first conbustion event using Range #1 or #2 below: Thermostat type is divided into normal (non-heated) and electrically heated. For this application the "type" cal (KeTHMG_b_TMS_ElecThstEquipped) = 0 If the type cal is equal to one, the application has an electrically heated t-stat, if equal to zero the the application has an non heated t-stat. See appropiate section below. ********** Type cal above = 1 (Electrically heated t-stat) == == == == Range #1 (Primary) ECT reaches Commanded temperature minus 11 °C when Ambient min is ≤ 52 °C and > 10 °C. Note: Warm up target for range #1 will be at least 87 °C == == == == Range #2 (Alternate) ECT reaches Commanded temperature minus 11 °C when Ambient min is ≤ 10 °C and > -7 °C. Note: Warm up target for range #2 will be at least	See the two tables named: **P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary** and **P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate** in the Supporting tables section. This diagnostic models the net energy into and out of the cooling	No Active DTC's Engine not run time (soaking time before current trip) Engine run time Fuel Condition Distance traveled ********** If Engine RPM is continuously greater than for this time period The diagnostic test for this key cycle will abort ********** ********** If T-Stat Heater commanded duty cycle for this time period The diagnostic test for this	ECT_Sensor_Ckt_FA ECT_Sensor_Perf_FA VehicleSpeedSensor_FA OAT_PtEstFiltFA IAT_SensorCircuitFA MAF_SensorFA THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA THMR_SWP_NoFlow_FA THMR_SWP_FlowStuckOn_FA ETQR_IndTorqInaccurate ≥ 1,800 seconds 75 ≤ Eng Run Tme ≤ 1,470 seconds Ethanol ≤ 87 % ≥ 1.20 km ********** 6,000 rpm 5.0 seconds ********** ********** > 20.0 % duty cycle > 5.0 seconds	1 failure to set DTC 1 sec/ sample Once per ignition key cycle	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			87 °C ********** Type cal above = 0 (non - heated t-stat) == == == == Range #1 (Primary) ECT reaches 87 °C when Ambient min is ≤ 52 °C and > 10 °C. == == == == Range #2 (Alternate) ECT reaches 87 °C when Ambient min is ≤ 10 °C and > -7 °C. **********	system during the warm-up process. The five energy terms are: heat from combustion, heat from after-run, heat loss to enviroment, heat loss to cabin and heat loss to DFCO.	key cycle will abort ********** ECT at start run	 ********** -60 ≤ ECT ≤ 82 °C		

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 1	P0131	This DTC determines if the O2 sensor circuit is shorted to low.	Oxygen Sensor Signal	< 50.0 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_ThrottleAuthorityDefaulted MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA = Not active = Not active = Not active = Not active 10.0 < Volts = Not active = Not active = Not active = Not active = False 0.9922 < ratio < 1.0137 50 < mgram < 700 = Closed Loop = TRUE Enabled (On) Ethanol ≤ 87 % DFCO not active > 2.0 seconds	380 failures out of 475 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

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	No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Low Fuel Condition Diag Learned Htr resistance Initial delay after Open Test Criteria met (cold start condition) Initial delay after Open Test Criteria met (not cold start condition) Equivalence Ratio All of the above met for	TPS_ThrottleAuthority Defaulted MAF_SensorFA MAP_SensorFA ExcessPurgePsbl_FA FuelInjectorCircuit_FA EthanolCompositionSensor_FA AIR System FA 10.0 < Volts = All Cylinders active = Complete > 5.0 seconds > 30.0 seconds = False = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's") > 235.0 seconds when engine soak time > 28,800 seconds > 235.0 seconds when engine soak time ≤ 28,800 seconds 0.9922 ≤ ratio ≤ 1.0137 > 2.0 seconds	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Slow Response Bank 1 Sensor 1) (For use with ESPD	P0133	This DTC determines if the O2 sensor response time is degraded.	Fault condition present when the average response time is caluclated over the test time, and compared to the threshold. OR Slope Time L/R Switches OR Slope Time R/L Switches	Refer to **P0133_O2S Slow Response Bank 1 Sensor 1 "Pass/Fail Threshold table"** in the Supporting Tables tab < 3 < 3 The test averages the signal response time over 60.0 seconds when the signal is transitioning between 300 mvolts and 600 mvolts. An average rich to lean time and lean to rich time are each calculated separately.	No Active DTC's Bank 1 Sensor 1 DTC's not active 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 EthanolCompositionSensor_FA EngineMisfireDetected_FA P0131, P0132, P0134 10.0 < Volts = 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 the following locations: B1S1, B2S1 (if applicable)	Sample time is 60 seconds Frequency: Once per trip	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						in Supporting Tables tab.		
					O2 Heater on for Learned Htr resistance	≥ 40 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Engine Coolant IAT Engine run Accum	> 50 ºC > -40 ºC > 30 seconds		
					Time since any AFM status change Time since Purge On to Off change Time since Purge Off to On change	> 2.0 seconds > 1.0 seconds > 2.0 seconds		
					Engine airflow Engine speed Fuel Condition Baro Air Per Cylinder	20 ≤ grams/second ≤ 55 1,000 <= RPM <= 3,000 < 87 % Ethanol > 70 kpa ≥ 200 mGrams		
					Fuel Control State Closed Loop Active LTM fuel cell Transient Fuel Mass Baro Fuel Control State Fuel State Commanded Proportional Gain	= Closed Loop = TRUE = Enabled ≤ 100.0 mgrams = Not Defaulted not = Power Enrichment DFCO not active ≥ 0.0 %		
					========== All of the above met for	========== > 3.5 seconds		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 = 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

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_ThrottleAuthorityDefaultedMAP_SensorFAAIR System FAEthanol Composition Sensor FAEvapPurgeSolenoidCircuit_FAEvapFlowDuringNonPurge_FAEvapVentSolenoidCircuit_FAEvapSmallLeak_FAEvapEmissionSystem_FAFuelTankPressureSnsrCkt_FAFuelInjector Circuit_FA = Not active = Not active = Not active = Not active 10.0 < Volts = 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

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	No Active DTC's	TPS_ThrottleAuthorityDefaulted MAF_SensorFA MAP_SensorFA ExcessPurgePsbl_FA FuelInjectorCircuit_FA EthanolCompositionSensor_FA AIR System_FA	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips
					System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum	10.0 < Volts = All Cylinders active = Complete > 5.0 seconds > 30.0 seconds		
					Low Fuel Condition Diag	= False		
					Learned Htr resistance	= Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Initial delay after Open Test Criteria met (cold start condition)	> 235.0 seconds when engine soak time > 28,800 seconds		
					Initial delay after Open Test Criteria met (not cold start condition)	> 235.0 seconds when engine soak time ≤ 28,800 seconds		
					Equivalence Ratio Fuel Control State	0.9922 ≤ ratio ≤ 1.0137 not = Power Enrichment		
					All of the above met for	> 2.0 seconds		

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)	> 9.0 units > 70.0 grams (upper voltage threshold is 450 mvolts and lower voltage threshold is 150 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 = 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 < 125.0 Nm	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor 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) ==========		

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)	> 9.0 units > 200 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 = 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_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						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).		
					Low Fuel Condition Diag Post fuel cell	= False = enabled		
					DTC's Passed	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)		
					========== 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	==========		

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)	> 9.0 units > 70.0 grams (upper voltage threshold is 450 mvolts and lower voltage threshold is 150 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 = 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_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor 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).	< 125.0 Nm P2270 (and P2272 if applicable) P013E (and P014A if applicable) ==========		

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)	> 9.0 units > 200 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 = 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_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						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).		
					Low Fuel Condition Diag Post fuel cell	= False = enabled		
					DTC's Passed	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)		
					========== 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	==========		

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 2	P013E	This DTC determines if the post 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.	Post O2 sensor voltage AND The Accumulated mass air flow monitored during the Delayed Response Test under DFCO DFCO begins after: 1) Catalyst has been rich for a minimum of AND 2) Catalyst Rich Accumulation Air Flow is greater or equal to	> 450 mvolts > 60 grams > 1 secs > 10 grams	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)	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, P013B, P013F, P2270 or P2271 10.0 < Volts = 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	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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).	< 125.0 Nm P2270 (and P2272 if applicable) ≤ 7 cylinders ==========		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Delayed Response Lean to Rich Bank 1 Sensor 2	P013F	This DTC determines if the post catalyst O2 sensor has an initial delayed response to an A/F change from Lean to Rich. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	Post O2 sensor voltage AND The Accumulated mass air flow monitored during the Delayed Response Test	< 350 mvolts > 400 grams	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, P013B, P013E, P2270 or P2271 10.0 < Volts = 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_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						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).		
					Low Fuel Condition Diag Post fuel cell	= False = enabled		
					DTC's Passed	P2270 (and P2272 if applicable) P013E (and P014A if applicable) P013A (and P013C if applicable) P2271 (and P2273 if applicable)		
					Number of fueled cylinders ========== After above conditions are met: Fuel Enrich mode entered. ========== During this test the following must stay TRUE or the test will abort: 0.95 ≤ Fuel EQR ≤ 1.10	≥ 1 cylinders ==========		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 = 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

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 2	P014A	This DTC determines if the post 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.	Post O2 sensor voltage AND The Accumulated mass air flow monitored during the Delayed Response Test under DFCO DFCO begins after: 1) Catalyst has been rich for a minimum of AND 2) Catalyst Rich Accumulation Air Flow is greater or equal to	> 450 mvolts > 60 grams > 1 secs > 10 grams	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 P013C, P013D, P014B, P2272 or P2273 10.0 < Volts = 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_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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).	< 125.0 Nm P2270 (and P2272 if applicable) ≤ 7 cylinders ==========		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Delayed Response Lean to Rich Bank 2 Sensor 2	P014B	This DTC determines if the post catalyst O2 sensor has an initial delayed response to an A/F change from Lean to Rich. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	Post O2 sensor AND The Accumulated mass air flow monitored during the Delayed Response Test	< 350 mvolts > 400 grams.	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 FAFuelInjectorCircuit_FAFuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013C, P013D, P014A, P2272 or P2273 10.0 < Volts = 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_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						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).		
					Low Fuel Condition Diag Post fuel cell	= False = enabled		
					DTC's Passed	P2270 (and P2272 if applicable) P013E (and P014A if applicable) P013A (and P013C if applicable) P2271 (and P2273 if applicable)		
					Number of fueled cylinders ========== After above conditions are met: Fuel Enrich mode entered. ========== During this test the following must stay TRUE or the test will abort: 0.95 ≤ Fuel EQR ≤ 1.10	≥ 1 cylinders ==========		

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 EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA = Not active = Not active = Not active = Not active 10.0 < Volts = 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

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	No Active DTC's	TPS_ThrottleAuthorityDefaulted MAF_SensorFA MAP_SensorFA ExcessPurgePsbl_FA FuelInjectorCircuit_FA EthanolCompositionSensor_FA AIR System_FA	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips
					System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum	10.0 < Volts = All Cylinders active = Complete > 5.0 seconds > 30.0 seconds		
					Low Fuel Condition Diag	= False		
					Learned Htr resistance	= Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Initial delay after Open Test Criteria met (cold start condition)	> 280.0 seconds when engine soak time > 28,800 seconds		
					Initial delay after Open Test Criteria met (not cold start condition)	> 280.0 seconds when engine soak time ≤ 28,800 seconds		
					Equivalence Ratio	0.9922 ≤ ratio ≤ 1.0137		
					Fuel Control State	not = Power Enrichment		
					All of the above met for	> 2 seconds		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Slow Response Bank 2 Sensor 1) (For use with ESPD	P0153	This DTC determines if the O2 sensor response time is degraded.	Fault condition present when the average response time is caluclated over the test time, and compared to the threshold. OR Slope Time L/R Switches OR Slope Time R/L Switches	Refer to **P0153_O2S Slow Response Bank 2 Sensor 1 "Pass/Fail Threshold table"** in the Supporting Tables tab < 3 < 3 The test averages the signal response time over 60.0 seconds when the signal is transitioning between 300 mvolts and 600 mvolts. An average rich to lean time and lean to rich time are each calculated separately.	No Active DTC's Bank 2 Sensor 1 DTC's not active 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 EthanolCompositionSensor_FA EngineMisfireDetected_FA = P0151, P0152 or P0154 10.0 < Volts = 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 the following locations: B1S1, B2S1 in Supporting	Sample time is 60 seconds Frequency: Once per trip	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						Tables tab.		
					O2 Heater on for Learned Htr resistance	≥ 40 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Engine Coolant IAT Engine run Accum	> 50 ºC > -40 ºC > 30 seconds		
					Time since any AFM status change Time since Purge On to Off change Time since Purge Off to On change	> 2.0 seconds > 1.0 seconds > 2.0 seconds		
					Engine airflow Engine speed Fuel Condition Baro Air Per Cylinder	20 ≤ grams/second ≤ 55 1,000 ≤ RPM ≤ 3,000 < 87 % Ethanol > 70 kpa >= 200 mGrams		
					Fuel Control State Closed Loop Active LTM fuel cell Transient Fuel Mass Baro Fuel Control State Fuel State Commanded Proportional Gain	= Closed Loop = TRUE = Enabled ≤ 100.0 mgrams = Not Defaulted not = Power Enrichment DFCO not active ≥ 0.0 %		
					========== All of the above met for	========== > 3.5 seconds		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 = 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

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 2	P0157	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_ThrottleAuthorityDefaulted MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA = Not active = Not active = Not active = Not active 10.0 < Volts = Not active = Not active = Not active = Not active = False 0.9922 ≤ ratio ≤ 1.0137 50 ≤ mgrams ≤ 700 = Closed Loop = TRUE Enabled (On) ≤ 87 % Ethanol DFCO not active > 2.0 seconds	430 failures out of 540 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

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	No Active DTC's	TPS_ThrottleAuthorityDefaulted MAF_SensorFA MAP_SensorFA ExcessPurgePsbl_FA FuelInjectorCircuit_FA EthanolCompositionSensor_FA AIR System_FA	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips
					System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum	10.0 < Volts = All Cylinders active = Complete > 5.0 seconds > 30.0 seconds		
					Low Fuel Condition Diag	= False		
					Learned Htr resistance	= Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Initial delay after Open Test Criteria met (cold start condition)	> 280.0 seconds when engine soak time > 28,800 seconds		
					Initial delay after Open Test Criteria met (not cold start condition)	> 280.0 seconds when engine soak time ≤ 28,800 seconds		
					Equivalence Ratio	0.9922 ≤ ratio ≤ 1.0137		
					Fuel Control State	not = Power Enrichment		
					All of the above met for	> 2 seconds		

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	> 0.6 EWMA (sec) ≥ 2.5 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 = 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_FastInitRespIsActive = TRUE for the given Fuel Bank OR NaESPD_b_RapidResponseIsActive = TRUE, multiple tests per trip are allowed	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						the following locations: B1S1, B2S1 (if applicable) in Supporting Tables tab.		
					O2 Heater (pre sensor) on for Learned Htr resistance	≥ 40 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Engine Coolant IAT Engine run Accum	> 50 ºC > -40 ºC > 30 seconds		
					Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled)	1,000 ≤ RPM ≤ 2,500 950 ≤ RPM ≤ 2,550		
					Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled)	4 ≤ gps ≤ 20 38.5 ≤ MPH ≤ 74.6 36.0 ≤ MPH ≤ 77.7		
					Closed loop integral Closed Loop Active Evap Ethanol Post fuel cell	0.75 ≤ C/L Int ≤ 1.08 = TRUE not in control of purge not in estimate mode = enabled		
					EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp Fuel State	= not active = not active ≥ 60.0 sec 600 ≤ ºC ≤ 900 = DFCO possible		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					========== All of the above met for at least 1.0 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).	========== ========== ≥ 690 mvolts = DFCO active ≤ 7 cylinders ==========		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Delayed Response Lean to Rich Bank 1 Sensor 1	P015B	This DTC determines if the pre catalyst O2 sensor has an initial delayed response to an A/F change from Lean to Rich. The diagnostic is an intrusive test which runs in an enriched fuel mode to achieve the required response.	The EWMA of the Pre O2 sensor normalized L2R time delay value OR [The Accumulated time monitored during the L2R Delayed Response Test (Gross failure). AND Pre O2 sensor voltage is OR At end of Cat Rich stage the Pre O2 sensor output is	> 0.6 EWMA (sec) ≥ 2.5 Seconds < 350 mvolts < 690 mvolts	No Active DTC's	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	Frequency: Once per trip Note: if NaESPD_b_FastInitRespIsActive = TRUE for the given Fuel Bank OR NaESPD_b_RapidResponseIsActive = TRUE, multiple tests per trip are allowed	Type A, 1 Trips EWMA
					System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Diag Green O2S Condition	10.0 < Volts = 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		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						the following locations: B1S1, B2S1 (if applicable) in Supporting Tables tab.		
					O2 Heater (pre sensor) on for	≥ 40 seconds		
					Learned Htr resistance	= Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Engine Coolant	> 50 ºC		
					IAT	> -40 ºC		
					Engine run Accum	> 30 seconds		
					Engine Speed to initially enable test	1,000 ≤ RPM ≤ 2,500		
					Engine Speed range to keep test enabled (after initially enabled)	950 ≤ RPM ≤ 2,550		
					Engine Airflow	4 ≤ gps ≤ 20		
					Vehicle Speed to initially enable test	38.5 ≤ MPH ≤ 74.6		
					Vehicle Speed range to keep test enabled (after initially enabled)	36.0 ≤ MPH ≤ 77.7		
					Closed loop integral	0.75 ≤ C/L Int ≤ 1.08		
					Closed Loop Active	= TRUE		
					Evap	not in control of purge		
					Ethanol	not in estimate mode		
					Post fuel cell	= enabled		
					EGR Intrusive diagnostic	= not active		
					All post sensor heater delays	= not active		
					O2S Heater (post sensor) on Time	≥ 60.0 sec		
					Predicted Catalyst temp	600 ≤ ºC ≤ 900		

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 ≥ 1 cylinders ========== ========== 4 ≤ gps ≤ 20 ≤ 100.0 gps		

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]	> 0.6 EWMA (sec) ≥ 2.5 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 = 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_FastInitRespIsActive = TRUE for the given Fuel Bank OR NaESPD_b_RapidResponseIsActive = TRUE, multiple tests per trip are allowed	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						the following locations: B1S1, B2S1 in Supporting Tables tab.		
					O2 Heater (pre sensor) on for	≥ 40 seconds		
					Learned Htr resistance	= Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Engine Coolant	> 50 ºC		
					IAT	> -40 ºC		
					Engine run Accum	> 30 seconds		
					Engine Speed to initially enable test	1,000 ≤ RPM ≤ 2,500		
					Engine Speed range to keep test enabled (after initially enabled)	950 ≤ RPM ≤ 2,550		
					Engine Airflow	4 ≤ gps ≤ 20		
					Vehicle Speed to initially enable test	38.5 ≤ MPH ≤ 74.6		
					Vehicle Speed range to keep test enabled (after initially enabled)	36.0 ≤ MPH ≤ 77.7		
					Closed loop integral	0.75 ≤ C/L Int ≤ 1.08		
					Closed Loop Active	= TRUE		
					Evap	not in control of purge		
					Ethanol	not in estimate mode		
					Post fuel cell	= enabled		
					EGR Intrusive diagnostic	= not active		
					All post sensor heater delays	= not active		
					O2S Heater (post sensor) on Time	≥ 60.0 sec		
					Predicted Catalyst temp	600 ≤ ºC ≤ 900		

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 1.0 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 ≤ 7 cylinders ==========		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Delayed Response Lean to Rich Bank 2 Sensor 1	P015D	This DTC determines if the pre catalyst O2 sensor has an initial delayed response to an A/F change from Lean to Rich. The diagnostic is an intrusive test which runs in an enriched fuel mode to achieve the required response.	The EWMA of the Pre O2 sensor normalized L2R time delay value OR [The Accumulated time monitored during the L2R Delayed Response Test (Gross failure). AND Pre O2 sensor voltage is below] OR At end of Cat Rich stage the Pre O2 sensor output is	> 0.6 EWMA (sec) ≥ 2.5 Seconds < 350 mvolts < 690 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 = 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_FastInitRespIsActive = TRUE for the given Fuel Bank OR NaESPD_b_RapidResponseIsActive = TRUE, multiple tests per trip are allowed	Type A, 1 Trips EWMA

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						the following locations: B1S1, B2S1 in Supporting Tables tab.		
					O2 Heater (pre sensor) on for	≥ 40 seconds		
					Learned Htr resistance	= Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Engine Coolant	> 50 ºC		
					IAT	> -40 ºC		
					Engine run Accum	> 30 seconds		
					Engine Speed to initially enable test	1,000 ≤ RPM ≤ 2,500		
					Engine Speed range to keep test enabled (after initially enabled)	950 ≤ RPM ≤ 2,550		
					Engine Airflow	4 ≤ gps ≤ 20		
					Vehicle Speed to initially enable test	38.5 ≤ MPH ≤ 74.6		
					Vehicle Speed range to keep test enabled (after initially enabled)	36.0 ≤ MPH ≤ 77.7		
					Closed loop integral	0.75 ≤ C/L Int ≤ 1.08		
					Closed Loop Active	= TRUE		
					Evap	not in control of purge		
					Ethanol	not in estimate mode		
					Post fuel cell	= enabled		
					EGR Intrusive diagnostic	= not active		
					All post sensor heater delays	= not active		
					O2S Heater (post sensor) on Time	≥ 60.0 sec		
					Predicted Catalyst temp	600 ≤ ºC ≤ 900		
					Fuel State	= DFCO inhibit		

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 :	≥ 1 cylinders ========== ========== 4 ≤ gps ≤ 20 ≤ 100.0 gps		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 = 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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel System Too Lean Bank 1	P0171	Determines if the fuel control system is in a lean condition, based on the filtered long-term and short-term fuel trim.	The filtered long-term fuel trim metric AND The filtered short-term fuel trim metric (Note: any value below 0.95 effectively nullifies the short-term fuel trim criteria)	>= 1.345 >= 0.100	Engine speed BARO Coolant Temp MAP Inlet Air Temp MAF Fuel Level Long Term Fuel Trim data accumulation: Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control and/or diagnosis Closed Loop Long Term FT EGR Diag. Catalyst Diag. Post O2 Diag.	375 <rpm< 7,000 > 70 kPa -40 <°C< 150 10 <kPa< 255 -20 <°C< 150 1.0 <g/s< 510.0 > 10 % or if fuel sender is faulty the diagnostic will bypass the fuel level criteria. > 25.0 seconds of data must accumulate on each trip, with at least 15.0 seconds of data in the current fuel trim cell before a pass or fail decision can be made. (Please see "**Long-Term Fuel Trim Cell Usage**" in Supporting Tables for a list of cells utilized for diagnosis) Enabled Enabled (Please see "**Closed Loop Enable Criteria**" and "**Long Term FT Enable Criteria**" in Supporting Tables.) Intrusive Test Not Active Intrusive Test Not Active Intrusive Test Not Active	Frequency: 100 ms Continuous Loop	Type B, 2 Trips

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 AmbPresDfltdStatus TC_BoostPresSnsrFA O2Snsr_B1_Snsr_1_FA		

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	Determines if the fuel control system is in a rich condition, based on the filtered long-term fuel trim metric. 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. Intrusive Test: If the filtered Purge Long Term Fuel Trim metric > 0.750 , 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 <= 0.750 , purge is ramped off to determine if excess purge vapor is the cause of the rich condition. Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions,	Passive Test: The filtered Non-Purge Long Term Fuel Trim metric AND The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria) Intrusive Test: For 3 out of 5 intrusive segments, the filtered Purge Long Term Fuel Trim metric AND The filtered Non-Purge Long Term Fuel Trim metric AND The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria) 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	<= 0.745 <= 2.000 <= 0.750 <= 0.745 <= 2.000		Secondary Parameters and Enable Conditions are identical to those for P0171, with the exception that fuel level is not considered.	Frequency: 100 ms Continuous Loop	Type B, 2 Trips

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 > 0.750 for at least 200 seconds, indicating that the canister has been purged.					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel System Too Lean Bank 2	P0174	Determines if the fuel control system is in a lean condition, based on the filtered long-term and short-term fuel trim.	The filtered long-term fuel trim metric AND The filtered short-term fuel trim metric (Note: any value below 0.95 effectively nullifies the short-term fuel trim criteria)	>= 1.345 >= 0.100	Engine speed BARO Coolant Temp MAP Inlet Air Temp MAF Fuel Level Long Term Fuel Trim data accumulation: Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control and/or diagnosis Closed Loop Long Term FT EGR Diag. Catalyst Diag. Post O2 Diag. Device Control	375 <rpm< 7,000 > 70 kPa -40 <°C< 150 10 <kPa< 255 -20 <°C< 150 1.0 <g/s< 510.0 > 10 % or if fuel sender is faulty the diagnostic will bypass the fuel level criteria. > 25.0 seconds of data must accumulate on each trip, with at least 15.0 seconds of data in the current fuel trim cell before a pass or fail decision can be made. (Please see "**Long-Term Fuel Trim Cell Usage**" in Supporting Tables for a list of cells utilized for diagnosis) Enabled Enabled (Please see "**Closed Loop Enable Criteria**" and "**Long Term FT Enable Criteria**" in Supporting Tables.) Intrusive Test Not Active Intrusive Test Not Active Intrusive Test Not Active Not Active	Frequency: 100 ms Continuous Loop	Type B, 2 Trips

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 AmbPresDfltdStatus TC_BoostPresSnsrFA O2Snsr_B2_Snsr_1_FA		

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	Determines if the fuel control system is in a rich condition, based on the filtered long-term fuel trim metric. 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. Intrusive Test: If the filtered Purge Long Term Fuel Trim metric > 0.750 , 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 <= 0.750 , purge is ramped off to determine if excess purge vapor is the cause of the rich condition. Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions,	Passive Test: The filtered Non-Purge Long Term Fuel Trim metric AND The filtered Short Term Fuel Trim metric (Note: any value above 1.05 effectively nullifies the short-term fuel trim criteria) Intrusive Test: For 3 out of 5 intrusive segments, the filtered Purge Long Term Fuel Trim metric AND The filtered Non-Purge Long Term Fuel Trim metric AND The filtered Short Term Fuel Trim metric (Note: any value above1.05 effectively nullifies the short-term fuel trim criteria) 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	<= 0.745 <= 2.000 <= 0.750 <= 0.745 <= 2.000		Secondary Parameters and Enable Conditions are identical to those for P0174, with the exception that fuel level is not considered.	Frequency: 100 ms Continuous Loop	Type B, 2 Trips

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 > 0.750 for at least 200 seconds, indicating that the canister has been purged.					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Composition Sensor Circuit Low	P0178	Detects Out of Range Low Frequency Signal The ethanol sensor is designed to measure ethanol concentrations from E0 (50Hz) to E100 (150Hz), with a specified accuracy of 5% ethanol (i.e. 5Hz). Therefore, values less than 45Hz or greater than 155Hz are considered as faults.	Flex Fuel Sensor Output Frequency	< 45 Hertz	Powertrain Relay	> 11.0 Volts	50 failures out of 63 samples 100 ms loop Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Composition Sensor Circuit High	P0179	Detects Out of Range High Frequency Signal The ethanol sensor is designed to measure ethanol concentrations from E0 (50Hz) to E100 (150Hz), with a specified accuracy of 5% ethanol (i.e. 5Hz). Therefore, values less than 45Hz or greater than 155Hz are considered as faults.	Flex Fuel Sensor Output Frequency	> 155 Hertz <= 185	Powertrain Relay	> 11.0 Volts	50 failures out of 63 samples 100 ms loop Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Sensor "B" Circuit Range/ Performance	P018B	This DTC detects a fuel pressure sensor response stuck within the normal operating range using an intrusive test (see Notes)	Absolute value of fuel pressure change (as sensed during intrusive test)	<= 30 kPa	a] Diagnostic KeFRPD_b _FPSS_DiagEnbld b] Engine Run Time c] Engine Fuel Flow d] Fu Pump Control Enabled e] Fu Pump Control State f] Emissions Fuel Level Low g] Validity status VeFRPD_b_FPSS_ DataIntegrityOK IF [1] FRP Circuit Low Fault Active (DTC P018C) [2] FRP Circuit High Fault Active (DTC P018D) [3] Fu Pump Circuit Low Fault Active (DTC P0231) [4] Fu Pump Circuit High Fault Active (DTC P0232) [5] Fu Pump Circuit Open Fault Active (DTC P023F) [6] Reference Voltage Fault Status (DTC P0641) [7] Fu Pump Control Module Driver Over-temperature Fault Active (DTC P1255) [8] Fu Pump Driver Mod	a] == TRUE b] >= 5 sec c] > calibration value KeFRPD_dm_StkPresMin FuelFlow (0.047 gram/ sec typical) d] == TRUE e] Normal OR Fu Pres Snsr Stk Ctrl (rationality) f] <> TRUE g] == TRUE IF [1] <> TRUE [2] <> TRUE [3] <> TRUE [4] <> TRUE [5] <> TRUE [6] <> Active This Key [7] <> TRUE [8] <> TRUE	1 sample / 12.5 millisec Intrusive Test Duration: Fu Flow -related (5 to 12 sec)	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Ign Sw RunStart Pstn Ckt Low Fault Active (DTC P129D) [9] Fu Pump Driver Control Mod Enable Ckt Perf Fault Active(DTC P12A6)	[9] <> TRUE		

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Sensor "B" Circuit Low	P018C	This DTC detects if the fuel pressure sensor circuit is shorted low	Fu Rail Pres sensor voltage	< 0.14 V	Ignition	Run or Crank	72 failures / 80 samples 1 sample/12.5 ms	DTC Type A 1 trip

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Sensor "B" Circuit High	P018D	This DTC detects if the fuel pressure sensor circuit is shorted high	Fu Rail Pres sensor voltage	> 4.86 V	Ignition	Run or Crank	72 failures / 80 samples 1 sample/12.5 millisec	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SIDI High Pressure Sensor Performance - Dual Sensor	P0191	The DTC Diagnoses a skewed fuel rail sensor 1 via a comparison of sensor 2 continuously when the engine is running and the commanded pressure is steady	Primary sensor (P1) vs. Secondary sensor (P2) performance rationality	SIDI Dual High Pressure Sensor Equipped and SIDI High Pressure Sensor Performance Diagnostic Disabled Low Limit fail Filtered Fuel Control Error <= supporting table P0191 - KtFHPD_cmp_DPS_FailLoThrsh (Dual sensors) and (Filtered Absolute delta between sensor1 and sensor2 >= supporting table P0191 - KeFHPD_p_DPSPrsDiffFailThrsh (Dual Sensors) High Limit Fail: Filtered Fuel Control Error >= Supporting table P0191 - KtFHPD_cmp_DPS_FailHiThrsh (Dual Sensors)) and (FIltered Absolute delta between sensor1 and	Commanded Pressure rate of change (increasing or dercresing) < for a period of time >= Fuel pump temperature <= Desired pressure >=	0.70 mpa 1.25 seconds 1,000.00 degC -1.00 mpa Engine is not cranking Enabled when a code clear is not active or not exiting device control High Fuel pressure sensor ckt is Not FA	Filter Fuel Control Error term and Absolute delta between sensor1 and sensor2 exceed Low or High Fail limit for a duration >= 1.50 seconds This is diagnostic runs Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				sensor2 >= Supporting table P0191 - KeFHPD_p_DPSPrsDiffFailThrsh (Dual Sensors) Note: fuel control error is calcuated based on the squreroot of senor1 divided by sensor2, this value is filter to ensure proper failure detection. Absolute delta between sensor1 and sensor2 value is filter to ensure proper failure detection.				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Pressure Sensor Out of Range Low	P0192	This DTC Diagnoses High Pressure Sensor Out of Range Low	High Pressure Fuel Sensor	SIDI High Pressure Sensor 1 Out of range Time Based Enabled or SIDI High Pressure Sensor 1 Out of range Engine Synchronous Enabled <= 5 % of 5Vref	Battery Voltage	>= 11 Volts Engine Running	Both Run Continuously Engine Synchronous Mode 800 failures out of 1,000 samples Time Based Mode 400 failures out of 500 samples 6.25 ms Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Pressure Sensor Out of Range High	P0193	This DTC Diagnoses High Pressure Sensor Out of Range High	High Pressure Fuel Sensor	SIDI High Pressure Sensor 1 Out of range Time Based Enabled or SIDI High Pressure Sensor 1 Out of range Engine Synchronous Enabled >= 95 % of 5Vref	Battery Voltage	>= 11 Volts Engine Running	Both Run Continuously Engine Synchronous Mode 800 failures out of 1,000 samples Time Based Mode 400 failures out of 500 samples 6.25 ms Sample Continuous	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Open Circuit - (SIDI)	P0201	This DTC Diagnoses Injector 1 enable low side driver circuit for circuit faults.	Low current through the low side driver during operation indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Battery Voltage Engine Running	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Open Circuit - (SIDI)	P0202	This DTC Diagnoses Injector 2 enable low side driver circuit for circuit faults.	Low current through the low side driver during operation indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Open Circuit - (SIDI)	P0203	This DTC Diagnoses Injector 3 enable low side driver circuit for circuit faults.	Low current through the low side driver during operation indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Battery Voltage Engine Running	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Open Circuit - (SIDI)	P0204	This DTC Diagnoses Injector 4 enable low side driver circuit for circuit faults.	Low current through the low side driver during operation indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 5 Open Circuit - (SIDI)	P0205	This DTC Diagnoses Injector 5 enable low side driver circuit for circuit faults.	Low current through the low side driver during operation indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 Open Circuit - (SIDI)	P0206	This DTC Diagnoses Injector 6 enable low side driver circuit for circuit faults.	Low current through the low side driver during operation indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 7 Open Circuit - (SIDI)	P0207	This DTC Diagnoses Injector 7 enable low side driver circuit for circuit faults.	Low current through the low side driver during operation indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 8 Open Circuit - (SIDI)	P0208	This DTC Diagnoses Injector 8 enable low side driver circuit for circuit faults.	Low current through the low side driver during operation indicates open circuit	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Secondary Circuit Low	P0231	This DTC detects if the fuel pump control circuit is shorted to low	Fuel Pump Power Module Driver Circuit Ground Short enumeration	== Faulted (as reported by Fuel Pmp Pwr Mod)	a) FPPM configuration KeFRPR_e_ChassisFuel PresSysType b) Diagnostic KeFRPR_b_FPPM_ DrvrGshtDiagEnbld c) Fuel Pump Control Enable command d) Fuel Pump Control Enable time e) System Voltage f] FPPM Driver Status Alive Rolling Count Sample Faulted g] Diagnostic feedback received h] Fuel Pump Power Module output current	a) == CeFRPR_e_ECM_FPPM _Sys b) == TRUE c) == TRUE d) >= calibration value KeFRPR_Cnt_FPPM_ GshtDlyThrsh (0-80 sample loops) e) 11v < System V > 32v f] <> TRUE g] == TRUE h] < 75A	64 failures / 80 samples 1 sample/12.5 millisec	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Secondary Circuit High	P0232	This DTC detects if the fuel pump control circuit is shorted to high	Voltage offset relative to low state level of duty cycle pulse measured at fuel pump circuit	> 4.0 V	a) FPPM configuration KeFRPR_e_ChassisFuel PresSysType b) Diagnostic KeFRPR_b_FPPM_ DrvrPshtDiagEnbld c) Fuel Pump Control Enabled d] FPPM Arbitrated Fu Pmp Duty Cycle Rate of Change e] System voltage f] FPPM Driver Status Alive Rolling Count Sample Faulted g] Diagnostic feedback Received	a) == CeFRPR_e_ECM_ FPPM_Sys b) == TRUE c) == TRUE d] >= calibration value KeFRPR_cmp_FPPM_ PshtDC_ROC_Min e] 7v < System V > 32v f] <> TRUE g] == TRUE	64 failures / 80 samples 1 sample / 12.5 millisec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Secondary Circuit Open	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Power Module Driver Circuit Open enumeration	== Faulted (as reported by Fuel Pmp Pwr Mod)	a) FPPM configuration KeFRPR_e_ChassisFuel PresSysType b) Diagnostic KeFRPR_b_FPPM_ OpenCktDiagEnbld c) Arbitrated Fu Pmp Duty Cycle (%) d] Fuel Pump Control Enable Faulted e] FPPM Fu Pmp Driver Over-temperature Faulted f] FPPM Driver Status Alive Rolling Count Sample Faulted g] Diagnostic feedback received h] System Voltage	a) == CeFRPR_e_ECM_ FPPM_Sys b) == TRUE c) > calibration value KeFRPR_Pct_FPPM_ OpenCktDC_Thrsh (30% - 60%) d] <> TRUE e] <> TRUE f] <> TRUE g] == TRUE h] 7v < System V > 32v	40 test failures / 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 (SIDI)	P0261	This DTC Diagnoses Injector 1 enable low side driver circuit for circuit faults.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: ≤ 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0262	This DTC Diagnoses Injector 1 enable low side driver circuit for circuit faults.	Voltage High across low side driver during On state indicates short to power	Short to power: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0264	This DTC Diagnoses Injector 2 enable low side driver circuit for circuit faults.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: ≤ 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0265	This DTC Diagnoses Injector 2 enable low side driver circuit for circuit faults.	Voltage High across low side driver during On state indicates short to power	Short to power: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0267	This DTC Diagnoses Injector 3 enable low side driver circuit for circuit faults.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: ≤ 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0268	This DTC Diagnoses Injector 3 enable low side driver circuit for circuit faults.	Voltage High across low side driver during On state indicates short to power	Short to power: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0270	This DTC Diagnoses Injector 4 enable low side driver circuit for circuit faults.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: ≤ 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0271	This DTC Diagnoses Injector 4 enable low side driver circuit for circuit faults.	Voltage High across low side driver during On state indicates short to power	Short to power: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0273	This DTC Diagnoses Injector 5 enable low side driver circuit for circuit faults.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: ≤ 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0274	This DTC Diagnoses Injector 5 enable low side driver circuit for circuit faults.	Voltage High across low side driver during On state indicates short to power	Short to power: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0276	This DTC Diagnoses Injector 6 enable low side driver circuit for circuit faults.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: ≤ 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0277	This DTC Diagnoses Injector 6 enable low side driver circuit for circuit faults.	Voltage High across low side driver during On state indicates short to power	Short to power: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0279	This DTC Diagnoses Injector 7 enable low side driver circuit for circuit faults.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: ≤ 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0280	This DTC Diagnoses Injector 7 enable low side driver circuit for circuit faults.	Voltage High across low side driver during On state indicates short to power	Short to power: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0282	This DTC Diagnoses Injector 8 enable low side driver circuit for circuit faults.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: ≤ 1 volt between signal and controller ground	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 (SIDI)	P0283	This DTC Diagnoses Injector 8 enable low side driver circuit for circuit faults.	Voltage High across low side driver during On state indicates short to power	Short to power: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Random Misfire Detected Cylinder 1 Misfire Detected Cylinder 2 Misfire Detected Cylinder 3 Misfire Detected Cylinder 4 Misfire Detected Cylinder 5 Misfire Detected Cylinder 6 Misfire Detected Cylinder 7 Misfire Detected Cylinder 8 Misfire Detected	P0300 P0301 P0302 P0303 P0304 P0305 P0306 P0307 P0308	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.	Crankshaft Deceleration Value(s) vs. Engine Speed and Engine load The equation used to calculate deceleration value is tailored to specific vehicle operating conditions. The selection of the equation used is based on the 1st single cylinder continuous misfire threshold tables encountered that are not max of range. If all tables are max of range at a given speed/load, that speed load region is an ***Undetectable region*** see Algorithm Description Document for additional details. SINGLE CYLINDER CONTINUOUS MISFIRE((Medres_Decel Medres_Jerk OR (Medres_Decel Medres_Jerk OR (Lores_Decel Lores_Jerk OR (Lores_Decel Lores_Jerk OR RevBalanceTime)	- see details of thresholds on Supporting Tables Tab (P0300 Section) > **IdleSCD_Decel** AND > **IdleSCD_Jerk)** >**SCD_Decel** AND > **SCD_Jerk)** >**IdleCyl_Decel** AND > **IdleCyl_Jerk)** >**CylModeDecel** AND > **CylModeJerk)** >**RevMode_Decel**	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 ºC < ECT < 130 ºC < -7 ºC 21 ºC < ECT < 130 ºC 9.00 < volts < 32.00 < 95.00 % per 25 ms < 95.00 % per 25 ms Not Enabled	Emission Exceedence = any (5) failed 200 rev blocks out of (16) 200 rev block tests Failure reported for (1) Exceedence in 1st (16) 200 rev block tests, or (4) Exceedences thereafter. OR when Early Termination Reporting = Enabled and engine rev > 1,000 revs and < 3,200 revs at end of trip any Catalyst Exceedence = (1) 200 rev block as data supports for catalyst damage.	Type B, 2 Trips (Mil Flashes with Catalyst damage level of Misfire)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Other patterns of misfire use adjustments to the single cylinder continuous misfire threshold tables: RANDOM MISFIRE Use random misfire thresholds If no misfire for (Medres_Decel AND Medres_Jerk) OR (Medres_Decel AND Medres_Jerk) OR (Lores_Decel AND Lores_Jerk) OR (Lores_Decel AND Lores_Jerk) OR RevBalanceTime	 > 3 Engine Cycles > **IdleSCD_Decel** * **Random_SCD_Decel** > **IdleSCD_Jerk** * **Random_SCD_Jerk** > **SCD_Decel** * **Random_SCD_Decel** > **SCD_Jerk** * **Random_SCD_Jerk** > **IdleCyl_Decel** * **RandomCylModDecel** > **IdleCyl_Jerk** * **RandomCylModeJerk** > **CylModeDecel** * **RandomCylModDecel** > **CylModeJerk** * **RandomCylModeJerk** > **RevMode_Decel** * **RandomRevModDecl**			Catalyst Failure reported with (1 or 3) Exceedences in FTP, or (1) Exceedence outside FTP. Continuous	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			PAIRED CYLINDER MISFIRE If a cylinder & it's pair are above PAIR thresholds (Medres_Decel	> **IdleSCD_Decel** * **Pair_SCD_Decel**				
			AND Medres_Jerk)	> **IdleSCD_Jerk** * **Pair_SCD_Jerk**				
			OR (Medres_Decel	> **SCD_Decel** * **Pair_SCD_Decel**				
			AND Medres_Jerk)	> **SCD_Jerk** * **Pair_SCD_Jerk**				
			OR (Lores_Decel	> **IdleCyl_Decel** * **PairCylModeDecel**				
			AND Lores_Jerk)	> **IdleCyl_Jerk** * **PairCylModeJerk**				
			OR (Lores_Decel	> **CylModeDecel** * **PairCylModeDecel**				
			AND Lores_Jerk)	> **CylModeJerk** * **PairCylModeJerk**				
			OR (Revmode Active AND (within one engine cycle: 2nd largest Lores_Decel)	> **CylModeDecel** * **PairCylModeDecel**				
			AND Above TRUE for))	> 40 engine cycles out of 100 engine cycles				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			BANK MISFIRE Cylinders above Bank Thresholds (Medres_Decel AND Medres_Jerk) OR (Medres_Decel AND Medres_Jerk) OR (Lores_Decel AND Lores_Jerk) OR (Lores_Decel AND Lores_Jerk) CONSECUTIVE CYLINDER MISFIRE 1st cylinder uses single cyl continuous misfire thresholds; 2nd Cylinder uses: (Medres_Decel	>= 3 cylinders > **IdleSCD_Decel** * **Bank_SCD_Decel** > **IdleSCD_Jerk** * **Bank_SCD_Jerk** > **SCD_Decel** * **Bank_SCD_Decel** > **SCD_Jerk** * **Bank_SCD_Jerk** > **IdleCyl_Decel** * **BankCylModeDecel** > **IdleCyl_Jerk** * **BankCylModeJerk** > **CylModeDecel** * **BankCylModeDecel** > **CylModeJerk** * **BankCylModeJerk** > **IdleSCD_Decel** * **ConsecSCD_Decel**				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			AND Medres_Jerk)	> **IdleSCD_Jerk** * **ConsecSCD_Jerk**				
			OR (Medres_Decel	> **SCD_Decel** * **ConsecSCD_Decel**				
			AND Medres_Jerk)	> **SCD_Jerk** * **ConsecSCD_Jerk**				
			OR (Lores_Decel	> **IdleCyl_Decel** * **ConsecCylModDecel**				
			AND Lores_Jerk)	> **IdleCyl_Jerk** * **ConsecCylModeJerk**				
			OR (Lores_Decel	> **CylModeDecel** * **ConsecCylModDecel**				
			AND Lores_Jerk)	> **CylModeJerk** * **ConsecCylModeJerk**				
			CYLINDER DEACTIVATION MODE (Active Fuel Managment)					
			AFM: SINGLE CYLINDER CONTINUOUS MISFIRE (CylAfterDeacCyl_Decel	> **CylModeDecel** * **ClyAfterAFM_Decel**				
			AND CylAfterDeacCyl_Jerk)	> **CylModeJerk** * **CylAfterAFM_Jerk**				
			OR	> **CylModeDecel** *				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			(CylBeforeDeacCylDecel AND CylBeforeDeacCyl_Jerk)	**CylBeforeAFM_Decel** > **CylModeJerk** * **ClyBeforeAFM_Jerk**				
			AFM: RANDOM MISFIRE Use random misfire thresholds If no misfire for (CylAfterDeacCyl_Decel AND CylAfterDeacCyl_Jerk) (CylBeforeDeacCylDecel AND CylBeforeDeacCyl_Jerk)	> 3 Engine Cycles > **CylModeDecel** * **ClyAfterAFM_Decel** * **RandomAFM_Decl** > **CylModeJerk** * **CylAfterAFM_Jerk** * **RandomAFM_Jerk** > **CylModeDecel** * **ClyAfterAFM_Decel** * **RandomAFM_Decl** > **CylModeJerk** * **CylAfterAFM_Jerk** * **RandomAFM_Jerk** - see details on Supporting Tables Tab (P0300 Section)				
			Misfire Percent Emission Failure Threshold	≥ 1.81 % P0300				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Misfire Percent Catalyst Damage When engine speed and load are less than the FTP cals (3) catalyst damage exceedences are allowed.	> **Catalyst_Damage_ Misfire_Percentage** in Supporting Tables whenever secondary conditions are met. ≤ 0 FTP rpm AND ≤ 0 FTP % load disable conditions:	(at low speed/loads, one cylinder may not cause cat damage) Engine Speed Engine Load Misfire counts	> 1,500 rpm AND > 15 % load AND < 180 counts on one cylinder		
					Engine Speed	350 < rpm < ((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	4 cycle delay	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						CamLctnIntFA CamLctnExhFA CamSensorAnyLctnTFTKO AnyCamPhaser_FA AnyCamPhaser_TFTKO AmbPresDfltdStatus		
					P0315 & engine speed	> 1,000 rpm	4 cycle delay	
					Fuel Level Low	LowFuelConditionDiagnostic	500 cycle delay	
					Cam and Crank Sensors	in sync with each other	4 cycle delay	
					Misfire requests TCC unlock	Not honored because Transmission in hot mode or POPD intrusive diagnostic running	4 cycle delay	
					Fuel System Status	≠ Fuel Cut	4 cycle delay	
					Active FuelManagement	Transition in progress	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	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Manual Trans	Clutch shift	4 cycle delay	
					Accel Pedal Position AND Automatic transmission shift	> 95.00 %	7 cycle delay	
					After Fuel resumes on Automatic shift containing Fuel Cut		2 Cylinder delay	
					DRIVELINE RING FILTER After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early. Filter Driveline ring: Stop filter early:	> "**Ring Filter**" # of engine cycles after misfire in Supporting Tables > "**Number of Normals**" # of engine cycles after misfire in Supporting Tables tab		
					ABNORMAL ENGINE SPEED OSCILLATION: (checks each "misfire" candidate in 100 engine Cycle test to see if it looks like some disturbance like rough road (abnormal).) Used Off Idle, and while not shifting, TPS Engine Speed Veh Speed Auto Transmission	 > 3 % > 950 rpm > 3 mph not shifting		

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present within the 100 engine cycles. Typically used for checking a single misfire per engine cycle but can support some other patterns on some packages			
					Pattern Recog Enabled:	Enabled		
					Pattern Recog Enabled during Cylinder Deac	Enabled		
					Pattern Recog Enabled consecutive cyl pattrn	Enabled		
					Engine Speed	1,200 < rpm < 3,000		
					Veh Speed	> 5.0 mph		
					The 1st check for "recognized" is the 1st fired cylinder after the misfire candidate should both accelerate and jerk an amount based acceleration and jerk of Single Cylinder Misfire thresholds in effect at that speed and load.			
					(CylAfter_Accel	> Misfire_ decel * **1st_FireAftrMisfr_Acel**		
					AND			
					CylAfter_Jerk)	> Misfire_Jerk * **1st_FireAftrMisfr_Jerk**		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Addtionally, the crankhaft is checked again a small calibratible number of cylinders later to see if the distrubance is still large like rough road, or has calmed down like real misfire. The size of disturbance is compared to a multiplier times the ddt_jerk value used to detect misfire at that speed and load. If there is repetitive misfire on consecutive engine cycles, the expected snap is adjusted due to the higher expected disturbance.			
					Num of Cylinders after misfire to start check of crankshaft snap	3 Cylinders		
					"misfire" recognized if: Crankshaft snap after: isolated "misfire"	< Misfire_Jerk *** SnapDecayAfterMisfire**		
					repetative "misfire"	< Misfire_Jerk * **SnapDecayAfterMisfire * RepetSnapDecayAdjst** in Supporting Tables	discard 100 engine cycle test	
					At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present.			
					Ratio of Unrecog/Recog	> 0.60		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					:		discard 100 engine cycle test	
					NON-CRANKSHAFT BASED ROUGH ROAD:	Disabled		
					Rough Road Source	TOSS	discard 100 engine cycle test	
					IF Rough Road Source = WheelSpeedInECM			
					ABS/TCS	active		
					Wheel speed noise	> **WSSRoughRoadThres**		
					VSES	active	discard 100 engine cycle test	
					IF Rough Road Source = "FromABS"			
					ABS/TCS	active	4 cycle delay	
					RoughRoad	detected		
					VSES	active		
					IF Rough Road Source = "TOSS"			
					TOSS dispersion	>**TOSSRoughRoadThres** in supporting tables		
					AND No Active DTCs	Transmission Output Shaft Angular Velocity Validity		
						TransmissionEngagedState_FA (Auto Trans only)		
						Clutch Sensor FA (Manual Trans only)		

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

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? Engine Run Time Engine Speed Engine Air Flow ECT IAT	Yes ≥ 2.0 seconds ≤ 8,500 RPM ≥ 200 mg/cylinder and ≤ 2,000 mg/cylinder ≥ -40 deg's C ≥ -40 deg's C		Type B, 2 Trips
			Specific Enable Criteria and Thresholds for 3 individual parts of the performance diag:				First Order Lag Filters with Weight Coefficients	
			1. Excessive Knock Diag: Filtered Knock Intensity VaKNKD_k_PerfCylKnockIntFilt (where 'Knock Intensity' = 0 with no knock; and > 0 & proportional to knock magnitude with knock)	> 1.50 (no units)	Engine Speed Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	≥ 400 RPM ≥ 80 Revs	Excessive Knk Weight Coefficient = 0.0500 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 Engine Speed Cumlative Number of Engine Revs Above Min Eng Speed (per key	See **AbnormalNoise_CylsEnabled** (Supporting Tables) ≥ 8,500 RPM ≥ 100 Revs	Abn Noise Weight Coefficient = 0.0400 Updated each engine event	

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_PerfCylFlatFiltInt	- - - - - - - - - - - - - - - - - < 0.008 (no units)	cycle) - Engine Speed Cumlative Number of Engine Revs Above Min Eng Speed (per keycycle)	- ≥ 8,500 RPM ≥ 20 Revs	- - - - - - - - - - - - Flat Signal Weight Coefficient = 0.010 Updated each engine event	

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	This diagnostic checks for an open in the knock sensor circuit	Filtered FFT Output	> **OpenCktThrshMin** and < **OpenCktThrshMax** **See Supporting Tables** Thresholds for OpenMethod = 20 kHz: **OpenCktThrshMin (20 kHz)** & **OpenCktThrshMax (20 kHz)** Thresholds for OpenMethod = NormalNoise: **OpenCktThrshMin (Normal Noise)** & **OpenCktThrshMax (Normal Noise)**	Diagnostic Enabled? Engine Run Time Engine Speed Cumulative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow ECT IAT	Yes ≥ 2.0 seconds ≥ 400 RPM and ≤ 5,500 RPM ≥ 100 revs ≥ 10 mg/cylinder and ≤ 2,000 mg/cylinder ≥ -40 deg's C ≥ -40 deg's C	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0100 Updated each engine event	Type B, 2 Trips

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? Engine Run Time Engine Speed Engine Air Flow ECT IAT	Yes ≥ 2.0 seconds ≤ 8,500 RPM ≥ 200 mg/cylinder and ≤ 2,000 mg/cylinder ≥ -40 deg's C ≥ -40 deg's C		Type B, 2 Trips
			Specific Enable Criteria and Thresholds for 3 individual parts of the performance diag:				First Order Lag Filters with Weight Coefficients	
			- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - -	
			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 Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	≥ 400 RPM ≥ 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 Engine Speed Cumlative Number of Engine Revs Above Min Eng Speed (per key	See **AbnormalNoise_ CylsEnabled** (Supporting Tables) ≥ 4,000 RPM ≥ 100 Revs	Abnormal Noise Weight Coefficient = 0.0100 Updated each engine event	

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 Cumlative Number of Engine Revs Above Min Eng Speed (per keycycle)	- - - - - - - - - - - - - - - - - - - ≥ 8,500 RPM ≥ 5 Revs	- - - - - - - - - - - - - - Flat Signal Weight Coefficient = 0.010 Updated each engine event	

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

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

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	This diagnostic checks for an open in the knock sensor circuit	Filtered FFT Output	> OpenCktThrshMin and < OpenCktThrshMax **See Supporting Tables** Thresholds for OpenMethod = 20 kHz: **OpenCktThrshMin (20 kHz)** & **OpenCktThrshMax (20 kHz)** Thresholds for OpenMethod = NormalNoise: **OpenCktThrshMin (Normal Noise)** & **OpenCktThrshMax (Normal Noise)**	Diagnostic Enabled? Engine Run Time Engine Speed Cumlative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow ECT IAT	Yes ≥ 2.0 seconds ≥ 400 RPM and ≤ 5,500 RPM 100 revs ≥ 10 mg/cylinder and ≤ 2,000 mg/cylinder ≥ -40 deg's C ≥ -40 deg's C	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0100 Updated each engine event	Type B, 2 Trips

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? Engine Run Time Engine Speed Engine Air Flow ECT IAT	Yes ≥ 2.0 seconds ≤ 8,500 RPM ≥ 200 mg/cylinder and ≤ 2,000 mg/cylinder ≥ -40 deg's C ≥ -40 deg's C		Type B, 2 Trips
			Specific Enable Criteriaand Thresholds for 3 individual parts of the performance diag:				First Order Lag Filters with Weight Coefficients	
			- - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - -	- - - - - - - - - - - -	
			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 Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	≥ 400 RPM ≥ 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 Engine Speed Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	See **AbnormalNoise_CylsEnabled**(Supporting Tables) ≥ 4,000 RPM ≥ 100 Revs	Abnormal Noise Weight Coefficient = 0.0100 Updated each engine event	

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 ≥ 5 Revs	Flat Signal Weight Coefficient = 0.010 Updated each engine event	

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

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

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		Continuous every 12.5 msec	
			No crankshaft pulses received		Engine is Running OR Starter is engaged No DTC Active:	 P0340 P0341	2 failures out of 10 samples One sample per engine revolution	

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 P0335	Continuous every 250 msec	Type B, 2 Trips
			No crankshaft synchronization gap found	>= 0.4 seconds	Engine is Running Starter is not engaged		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:	 P0340 P0341	8 failures out of 10 samples One sample per engine revolution	

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 OR Time that starter has been engaged without a camshaft sensor pulse	>= 5.5 seconds >= 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
			Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Engine is running Starter is not engaged		Continuous every 100 msec	
			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:	 CrankSensor_FA	Continuous every MEDRES event	
			The number of camshaft pulses received during 100 engine cycles	= 0	Crankshaft is synchronized No DTC Active:	 CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

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:	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:	CrankSensorFA	8 failures out of 10 samples Continuous every engine cycle	

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #1 CIRCUIT	P0351	Diagnoses Cylinder #1 Ignition Control (EST) output driver circuit for an Open Circuit fault.	High impedance during driver high state (indicates open circuit)	$\geq$ 30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #2 CIRCUIT	P0352	Diagnoses Cylinder #2 Ignition Control (EST) output driver circuit for an Open Circuit fault.	High impedance during driver high state (indicates open circuit)	≥30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #3 CIRCUIT	P0353	Diagnoses Cylinder #3 Ignition Control (EST) output driver circuit for an Open Circuit fault.	High impedance during driver high state (indicates open circuit)	$\geq$ 30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #4 CIRCUIT	P0354	Diagnoses Cylinder #4 Ignition Control (EST) output driver circuit for an Open Circuit fault.	High impedance during driver high state (indicates open circuit)	≥ 30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #5 CIRCUIT	P0355	Diagnoses Cylinder #5 Ignition Control (EST) output driver circuit for an Open Circuit fault.	High impedance during driver high state (indicates open circuit)	$\geq$ 30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #6 CIRCUIT	P0356	Diagnoses Cylinder #6 Ignition Control (EST) output driver circuit for an Open Circuit fault.	High impedance during driver high state (indicates open circuit)	≥ 30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #7 CIRCUIT	P0357	Diagnoses Cylinder #7 Ignition Control (EST) output driver circuit for an Open Circuit fault.	High impedance during driver high state (indicates open circuit)	$\geq$ 30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #8 CIRCUIT	P0358	Diagnoses Cylinder #8 Ignition Control (EST) output driver circuit for an Open Circuit fault.	High impedance during driver high state (indicates open circuit)	$\geq$ 30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

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	NOTE: The information below applies to applications that use the Decel Catalyst Monitor Algorithm 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 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	Normalized Ratio OSC Value (EWMA filtered)	< 0.37	All enable criteria associated with P0420 can be found under P2270 - (O2 Sensor Signal Stuck Lean Bank 1 Sensor 2) Rapid Step Response (RSR) feature will initiate multiple tests: If the difference between current EWMA value and the current OSC Normalized Ratio value is and the current OSC Normalized Ratio value is Maximum number of RSR tests to detect failure when RSR is enabled. General Enable Criteria In addition to the p-codes listed under P2270, the following DTC's shall also not be set:	> 0.47 < 0.15 6 O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA	1 test attempted per valid decel period Minimum of 1 test per trip Maximum of 3 tests per trip Frequency: Fueling Related : 12.5 ms OSC Measurements: 100 ms Temp Prediction: 12.5ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		table (based on temp and exhaust gas flow) 3. WorstPassing OSC value (based on temp and exhaust gas flow) Normalized Ratio Calculation = (1-2) / (3-2) A Normalized Ratio of 1 essentially represents a good part and a ratio of 0 essentially represents a very bad part. Refer to the **P0420_WorstPassing OSCTableB1** and **P0420_BestFailingOS CTableB1** in Supporting Tables tab for details The Catalyst Monitoring Test is completed during a decel fuel cutoff event. This fuel cutoff event occurs following a rich instrusive 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. These conditions and their related values are listed in the "Secondary						

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)						

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	Note: The information below applies to applications that use the Decel Catalyst Monitor Algorithm 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 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	Normalized Ratio OSC Value (EWMA filtered)	< 0.38	All enable criteria associated with P0430 can be found under P2272 - (O2 Sensor Signal Stuck Lean Bank 2 Sensor 2) Rapid Step Response (RSR) feature will initiate multiple tests: If the difference between current EWMA value and the current OSC Normalized Ratio value is and the current OSC Normalized Ratio value is Maximum number of RSR tests to detect failure when RSR is enabled. General Enable Criteria In addition to the p-codes listed under P2272, the following DTC's shall also not be set:	> 0.48 < 0.21 6 O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA	1 test attempted per valid decel period Minimum of 1 test per trip Maximum of 3 tests per trip Frequency: Fueling Related : 12.5 ms OSC Measurements: 100 ms Temp Prediction: 12.5ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		table (based on temp and exhaust gas flow) 3. WorstPassing OSC value (based on temp and exhaust gas flow) Normalized Ratio Calculation = (1-2) / (3-2) A Normalized Ratio of 1 essentially represents a good part and a ratio of 0 essentially represents a very bad part. Refer to the **P0430_WorstPassing OSCTableB2** and **P0430_BestFailingOS CTableB2** in Supporting Tables tab for details The Catalyst Monitoring Test is completed during a decel fuel cutoff event. This fuel cutoff event occurs following a rich instrusive 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. These conditions and their related values are listed in the "Secondary						

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)						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission (EVAP) System Small Leak Detected (No ELCP - Conventional EVAP Diagnostic using OAT Sensor)	P0442	This DTC will detect a small leak (≥ 0.020") in the EVAP system between the fuel fill cap and the purge solenoid. On some applications a small leak is defined as ≥ 0.025", 0.030", or 0.150". The engine off natural vacuum method (EONV) is used. EONV is an evaporative system leak detection diagnostic that runs when the vehicle is shut off when enable conditions are met. Prior to sealing the system and performing the diagnostic, the fuel volatility is analyzed. In an open system (Canister Vent Solenoid [CVS] open) high volatility fuel creates enough flow to generate a measurable pressure differential relative to atmospheric.After the volatility check, the vent solenoid will close. After the vent is closed, typically a build up of pressure from the hot soak begins (phase-1). The pressure typically will peak and then begin to decrease as the fuel cools. When	The total delta from peak pressure to peak vacuum during the test is normalized against a calibration pressure threshold table that is based upon fuel level and ambient temperature. (Please see **P0442: EONV Pressure Threshold (Pascals) Table** in Supporting Tables). The normalized value is calculated by the following equation: 1 - (peak pressure - peak vacuum) / pressure threshold. The normalized value is entered into EWMA (with 0= perfect pass and 1= perfect fail). When EWMA is the DTC light is illuminated. The DTC light can be turned off if the EWMA is and stays below the EWMA fail threshold for 3 additional consecutive trips.	 > 0.55 (EWMA Fail Threshold), ≤ 0.35 (EWMA Re-Pass Threshold)	Fuel Level Drive Time Drive length ECT Baro Distance since assembly plant Engine not run time before key off must be Time since last complete test if normalized result and EWMA is passing OR Time since last complete test if normalized result or EWMA is failing Estimated Ambient Temperature (EAT) using OAT sensor at end of drive Conditions for Estimated Ambient Temperature Using OAT Sensor to be Valid ***************************** 1. Startup OAT is less than previous trip EAT	10 % ≤ Percent ≤ 90 % ≥ 600 seconds ≥ 5.0 miles ≥ 63 °C ≥ 70 kPa ≥ 10.0 miles ≤ refer to **P0442: Engine Off Time Before Vehicle Off Maximum as a Function of Estimated Ambient Temperature Table** in Supporting Tables. ≥ 17 hours ≥ 10 hours 0 °C≤Temperature≤ 34 °C *****************************	Once per trip, during hot soak (up to 2,400 sec.). No more than 2 unsuccessful attempts between completed tests.	Type A, 1 Trips EWMA Average run length is 8 to 12 trips under normal condition s Run length is 3 to 6 trips after code clear or non-volatile reset

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		the pressure drops (-62.27) Pa from peak pressure, the vent is then opened for 60 seconds to normalize the system pressure. The vent is again closed to begin the vacuum portion of the test (phase-2). As the fuel temperature continues to fall, a vacuum will begin forming. The vacuum will continue until it reaches a vacuum peak. When the pressure rises 62.27 Pa from vacuum peak, the test then completes. If the key is turned on while the diagnostic test is in progress, the test will abort.			OR 2. Startup ECT - previous trip EAT OR 3. Engine off time OR 4. At startup, time since previous EAT valid and able to learn OR 5. EAT - current OAT OR 6. EAT < current OAT and speed timer and current OAT - EAT Speed timer increments at 100 msec rate and increments vary based on vehicle speed as follows: vehicle speed < 16 mph 16 mph<speed< 47 mph 47 mph<speed< 123.7 123.7 mph<speed< 124.3 Speed timer can never be less than 0 seconds ********** 1. High Fuel Volatility During the volatility phase, pressure in the fuel tank is integrated vs. volatility time. If the integrated pressure is then test aborts and	≤ 0 °C ≥ 7,200 seconds ≤ 3,600 seconds 0 °C ≤ difference ≤ 2 °C ≥ 240 seconds ≤ 2 °C - 10.0 seconds 0.13 seconds 0.25 seconds 1.00 seconds ********** < -5		

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					and Refueling Detected See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for information on fuel level refueling. OR 6. Vent Valve Override Failed Device control using an off-board tool to control the vent solenoid, cannot exceed during the EONV test OR 7. Key up during EONV test No active DTCs:	0.50 seconds MAF_SensorFA ECT_Sensor_FA IAT_SensorFA VehicleSpeedSensor_FA IgnitionOffTimeValid AmbientAirDefault P0443 P0446 P0449 P0452 P0453 P0455 P0496		

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 3 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)	Open circuit: ≥ 200 K Ω impedence between signal and controller ground	PT Relay Voltage	Voltage ≥ 11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0458 may also set (Canister Purge Solenoid Short to Ground)

Component/ System	Fault Code	Monitor 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 ≥ 8 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

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 3 DTC Implementation Only)	P0449	Diagnoses the vent solenoid low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	Open circuit: ≥ 200 K Ω impedence between signal and controller ground			20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0498 may also set (Vent Solenoid Short to Ground)

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.	The tank vacuum sensor voltage is compared to a window about the nominal sensor voltage offset (~1.5 volts) Upper voltage threshold (voltage addition above the nominal voltage) Lower voltage threshold (voltage subtraction below the nominal voltage) The difference between tank vacuum sensor voltage and the nominal offset voltage is then normalized against the appropriate threshold listed above to produce a ratio between 0.0 and 1.0. This normalized re-zero ratio is then filtered with a EWMA (with 0= perfect pass and 1=perfect fail). When EWMA is the DTC light is illuminated. The DTC light can be turned off if the EWMA is and stays below the EWMA fail threshold for 3 additional consecutive trips.	0.2 volts 0.2 volts > 0.73 (EWMA Fail Threshold), ≤ 0.40 (EWMA Re-Pass Threshold)	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The number of times that it executes can range from zero to two per engine-off period.The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.	Type A, 1 Trips EWMA Average run length: 6 Run length is 2 trips after code clear or non-volatile reset

Component/ System	Fault Code	Monitor 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

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

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission (EVAP) System Large Leak Detected (No ELCP - Conventional EVAP Diagnostic)	P0455	This DTC will detect a weak vacuum condition (large leak or purge blockage) in the EVAP system. Purge valve is controlled (to allow purge flow) and vent valve is commanded closed.	Purge volume while Tank vacuum After setting the DTC for the first time, 2 liters of fuel must be consumed before setting the DTC for the second time. Weak Vacuum Follow-up Test (fuel cap replacement test) Weak Vacuum Test failed. Passes if tank vacuum Note: Weak Vacuum Follow-up Test can only report a pass.	> 11 liters ≤ 2,740 Pa ≥ 2,740 Pa	Fuel Level System Voltage BARO Purge Flow No active DTCs: Cold Start Test If ECT > IAT, Startup temperature delta (ECT-IAT): Cold Test Timer Startup IAT Startup ECT Weak Vacuum Follow-up Test This test can run following a weak vacuum failure or on a hot restart.	10 % ≤ Percent ≤ 90 % 11 volts ≤ Voltage ≤ 32 volts ≥ 70 kPa ≥ 2.50 % MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454 ≤ 8 °C ≤ 1,000 seconds 4 °C≤Temperature≤ 30 °C ≤ 35 °C	Once per cold start Time is dependent on driving conditions Maximum time before test abort is 1,000 seconds Weak Vacuum Follow-up Test With large leak detected, the follow-up test is limited to 1,300 seconds. Once the MIL is on, the follow-up test runs indefinitely.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission System Purge Control Valve Circuit Low (No ELCP - Conventional EVAP Diagnostic)	P0458	Diagnoses the canister purge solenoid low side driver circuit for circuit faults	Voltage low during driver off state (indicates short to ground)	Short to ground: ≤ 0.5 Ω impedence between signal and controller ground	PT Relay Voltage	Voltage ≥ 11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0443 may also set (Canister Purge Solenoid Open Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission System Purge Control Valve Circuit High (No ELCP - Conventional EVAP Diagnostic)	P0459	Diagnoses the canister purge solenoid low side driver circuit for circuit faults	Voltage high during driver on state (indicates short to power)	Short to power: ≤ 0.5 Ω impedence 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

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 137 miles.	< 3 liters	Engine Running No active DTCs:	 VehicleSpeedSensor_FA	250 ms / sample	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 OBDG08 ECM Summary Tables (Initial DTCs)

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

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.	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 refueilng event is not confirmed, then the test sample is considered failing which indicates an intermittent signal problem. An intermittent fuel level signal problem is defined as: The fuel level changes by and does not remain for 30 seconds during a 600 second refueling rationality test.	 > 10 % > 10 %	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period.The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.The test will report a failure if 2 out of 3 samples are failures. 100 ms / sample	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 1 Relay Control Circuit Open (ODM) (Not used on EREV)	P0480	Diagnoses the cooling fan 1 relay 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	Powertrain Relay Voltage	Voltage ≥ 11.00 volts	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips Note: In certain controllers P0691 may also set (Fan 1 Short to Ground).

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission System Vent Solenoid Control Circuit Low (No ELCP - Conventional EVAP Diagnostic)	P0498	Diagnoses the vent solenoid low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short to ground)	Short to ground: ≤ 0.5 Ω impedence between signal and controller ground			20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0449 may also set (Vent Solenoid Open Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Evaporative Emission System Vent Solenoid Control Circuit High (No ELCP - Conventional EVAP Diagnostic)	P0499	Diagnoses the vent solenoid low side driver circuit for circuit faults. If the P0499 is active, an intrusive test is performed with the vent solenoid commanded closed for 15 seconds.	Voltage low during driver on state (indicates short to power)	Short to power: ≤ 0.5 Ω impedence between signal and controller power			20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Low Engine Speed Idle System	P0506	This DTC will determine if a low idle exists	Filtered Engine Speed Error	> 91.00 rpm	Baro	> 70 kPa	Diagnostic runs in every 12.5 ms loop	Type B, 2 Trips
			filter coefficient	0.00300	Coolant Temp	> KeSPDD_T_EnblECT_Min (60 °C) and < KfECTI_T_EngCoolHotHiThresh (128 °C) Must verify KfECTI_T_EngCoolHotLoThresh (125) is less than KfECTI_T_EngCoolHotHiThresh (128)	Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	
					Engine run time	≥ 60 sec		
					Ignition voltage	32 ≥ volts ≥ 11		
					Time since gear change	≥ 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -20 °C		
					Vehicle speed	≤ 1.24 mph		
					Commanded RPM delta	≤ 25 rpm		
					Idle time	> 10 sec		
					For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 12.00 pct < 75.00 pct		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No active DTCs	PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active. following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimit AND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) Clutch is not depressed TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All of the above met for Idle time	TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFault LowFuelConditionDiagnostic Clutch Sensor FA AmbPresDfltdStatus P2771 > 10 sec		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Engine Speed Idle System	P0507	This DTC will determine if a high idle exists	Filtered Engine Speed Error	< -182.00 rpm	Baro	> 70 kPa	Diagnostic runs in every 12.5 ms loop	Type B, 2 Trips
			filter coefficient	0.00300	Coolant Temp	> KeSPDD_T_EnblECT_Min (60 °C) and < KfECTI_T_EngCoolHotHiThresh (128 °C) Must verify KfECTI_T_EngCoolHotLoThresh (125) is less than KfECTI_T_EngCoolHotHiThresh (128)	Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	
					Engine run time	≥ 60 sec		
					Ignition voltage	32 ≥ volts ≥ 11		
					Time since gear change	≥ 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -20 °C		
					Vehicle speed	≤ 1.24 mph		
					Commanded RPM delta	≤ 25 rpm		
					For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 12.00 pct < 75.00 pct		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No active DTCs	PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active. following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimit AND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) Clutch is not depressed TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						FuelLevelDataFaultLow FuelConditionDiagnostic Clutch SensorFA AmbPresDfltdStatus P2771		
					All of the above met for Idle time	> 10 sec		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cold Start Rough Idle	P050D	Monitors the combustion performance when the cold start emission reduction strategy is active by accumulating and determining the percentage of engine cycles that have less than complete combustion relative to the total number of engine cycles in which Dual Pulse is active.	Deceleration index vs. Engine Speed Vs Engine load Deceleration index calculation is tailored to specific vehicle. Tables used are 1st tables encountered that are not max of range. Undetectable region at a given speed/load point is where all tables are max of range point. see Algorithm Description Document for additional details. Incomplete combustion identified by P0300 threshold tables:	(>Idle SCD AND >Idle SCD ddt Tables) OR (>Idle Cyl Mode AND > Idle Cyl Mode ddt Tables)	Misfire Algorithm Enabled (Refer to P0300 for Enablement Requirements) OBD Manufacturer Enable Counter To enable the diagnostic, the Cold Start Emission Reduction Strategy Must Be Active per the following: Catalyst Temperature AND Engine Coolant AND Engine Coolant AND Barometric Pressure In addition, Dual Pulse Strategy Is Enabled and Active Per the following: Engine Speed Accel Position Engine Run Time For the engine speeds and loads in which Dual Pulse is active:	= 0 < 300.00 degC > 17.00 degC <= 43.00 degC >= 75.00 KPa >= 550.00 RPM <= 2,000.00 RPM <= 1.00 Pct < 100 seconds	Runs once per trip when the cold start emission reduction strategy is active and Dual Pulse is enabled and active. Frequency: 100ms Test completes after Dual Pulse is no longer active OR The first 500 engine cycles have been reached	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Dual Pulse Error induced misfires percentage	>= catalyst damaging misfire		
					Dual Pulse Error induced misfires percentage	< 90% of the maximum achieveable catalyst damaging misfire.		
					Engine Cycles	>= 50 < 501		
					The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:			
					Catalyst Temperature AND Engine Run Time	>= 800.00 degC >= 1.00 seconds		
					OR Engine Run Time	 > **CatalystLightOffExtendedEngineRunTimeExit** This Extended Engine run time exit table is a function of percent ethanol and Catmons NormRatioEWMA. Refer to "Supporting Tables" for details.		
					OR Barometric Pressure	 < 75.00 KPa		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Dual Pulse Strategy will exit per the following:			
					Engine Speed OR Accel Position	> 2,500.00 RPM > 3.00 Pct		
					Engine Run Time	>= 100 seconds		
					Dual Pulse Strategy will also exit if the any of the "Additional Dual Pulse Enabling Criteria" is not satisfied:			
					"Additional Dual Pulse Enabling Criteria":			
					Green Engine Enrichment	Not Enabled		
					Misfire Converter Protection strategy	Not being requested		
					Engine Metal Overtemp strategy	Not being requested		
					Fuel control state	Open Loop		
					Output State Control	Not being requested for fuel		
					DOD Or DFCO	Not Active		
					Power Enrichment	Not Active		
					Dynamic Power Enrichment	Not Active		
					Piston Protection	Not Active		
					Hot Coolant Enrichment	Not Active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Injector Flow Test General Enable DTC's Not Set:	Not Active AcceleratorPedalFailure ECT_Sensor_FA IAT_SensorCircuitFA MnfdTempSensorCktFA CrankSensorFaultActive FuelInjectorCircuit_FA MAF_SensorFA MAP_SensorFA AnyCamPhaser_TFTKO Clutch Sensor FA IAC_SystemRPM_FA IgnitionOutputDriver_FA TPS_FA VehicleSpeedSensor_FA FuelInjectorCircuit_TFTKO FHPR_b_FRP_SnsrCkt_FA FHPR_b_FRP_SnsrCkt_TFTKO FHPR_b_PumpCkt_FA FHPR_b_PumpCkt_TFTKO TransmissionEngagedState_FA EngineTorqueInaccurate FuelPumpRlyCktFA		

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	**Single Stage Oil Pump EOP Sensor Test with Engine Running** If enabled: <u>To pass a currently failing test:</u> The filtered, weighted difference between measured EOP and predicted EOP (a function of engine speed and engine oil temp.): <u>To fail a currently passing test:</u> The filtered, weighted difference between measured EOP and predicted EOP (a function of engine speed and engine oil temp.):	< -50.0 kPa OR > 50.0 kPa > -47.0 kPa AND < 47.0 kPa	Two Stage Oil Pump is Present = FALSE Diagnostic enabled/ disabled Oil Pressure Sensor In Use 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. (**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 (See Details on P0521 Supporting Tables Tab) **RPM_Weighting_Factor** **RPM_Weighting_Factor**	TRUE Disabled Present >= 0.30 weighting	Performed every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					_X_Axis **Oil_Temp_Weighting_Factor** **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: EngOilPressureSensorCktFA CrankSensorFA ECT_Sensor_FA MAF_SensorFA IAT_SensorFA		
			Two Stage Oil Pump EOP Sensor Test with Engine Running If enabled: <u>To Fail when previously passing with the engine running:</u> Filtered Engine Oil Pressure below expected threshold OR	Filtered Oil Pressure ≤ **LowMinOilPresFail** (Details on Supporting Tables Tab) OR	Two Stage Oil Pump is Present = TRUE Engine Running Diagnostic enabled/ disabled Engine Off Rationality Test Diagnostic Reporting Status Oil Pressure Sensor In Use Engine Running Ambient Air Pressure	TRUE Enabled Test not report a fail state Present ≥ 30.0 seconds ≥ 70.0 kPa	≥ 40 errors out of 50 samples. Performed every 100 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Filtered Engine Oil Pressure below expected threshold <u>To pass when previously failing:</u> Filtered Engine Oil Pressure above low threshold plus an offset OR Filtered Engine Oil Pressure below high threshold minus an offset	Filtered Oil Pressure ≥ **(OP_HiStatePressure** * 1.25 + 175.0 kPa) (Details on Supporting Tables Tab) Filtered Oil Pressure ≥ 10.0 kPa+ **LowMinOilPresFail** (Details on Supporting Tables Tab) OR Filtered Oil Pressure ≤ (**OP_HiStatePressure** * 1.25 + 175.0 kPa) - 10.0 kPa (Details on Supporting Tables Tab)	Oil Aeration (= TRUE if engine speed > 8,000 RPM for longer than 65,000.0 seconds) Filtered Engine Speed within range Modelled Oil Temperature within range No active DTC's	FALSE 1,000 RPM ≤ Filtered Engine Speed ≤ 4,500 RPM 40.0 deg C ≤ Oil Temp ≤ 120.0 deg C Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA CrankSensorFA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA	≥ 10 passes out of 50 samples. Performed every 100 msec	
			Two Stage Oil Pump EOP Sensor Test with Engine Off If enabled: <u>To Fail when previously passing with the engine off:</u> Filtered Engine Oil Pressure greater than threshold	Filtered Oil Pressure ≥ 40.0 kPa	Two Stage Oil Pump is Present = TRUE Engine Off Rationality Test Diagnostic enabled/ disabled Engine Running Rationality Test Diagnostic Reporting Status Modelled Oil Temperature	TRUE Enabled Test not report a fail state ≥ 60.0 deg C	≥ 20 errors out of 40 samples. Run once per trip	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No Engine Movement No active DTC's	> 10.0 seconds EngineModeNotRunTimer_FA EngOilTempFA EngOilPressureSensorCktFA CrankSensorFA		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	800 failures out of 1,000 samples Performed every 6.25 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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	> 95.00 percent	Sensor Present Diagnostic enabled/ disabled	Present Enabled	800 failures out of 1,000 samples Performed every 6.25 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Air Conditioning High Side Pressure Sensor (HSPS) Circuit Low Voltage	P0532	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is too low	(AC High Side Pressure Sensor Circuit Voltage) / 5 Volts	< 3 percent	Sensor Present Diagnostic enabled/ disabled	Enabled Enabled	80 failures out of 100 samples Performed every 25 msec	Type C, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Air Conditioning High Side Pressure Sensor (HSPS) Circuit High Voltage	P0533	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is too high	(AC High Side Pressure Sensor Circuit Voltage) / 5 Volts	> 95 percent	Sensor Present Diagnostic enabled/ disabled	Enabled Enabled	80 failures out of 100 samples Performed every 25 msec	Type C, No MIL

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control On Switch Circuit	P0565		Cruise Control On 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 20.00 seconds	MIL Type C, No MIL

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 continously 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 89.000 seconds	MIL: Type C, No MIL

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 continously 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 89.000 seconds	MIL: Type C, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Cancel Switch Circuit	P056C		Cruise Control Cancel 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 20.00 seconds	MIL: Type C, No MIL

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Pedal Position Sensor Circuit Range/ Performance	P057B	This diagnostic monitors the Brake Pedal Position Sensor for a stuck in range failure	.		Brake Pedal Position Sensor Circuit Range / Performance Diagnostic Enable	1.00 ignition voltage > 10.00		MIL: Type A, 1 Trips
			Calculated EWMA value must be greater than calibratable theshold after calibratable number of tests have completed to report a "test passed" for P057B	EWMA value looked up in supporting table P057B KtBRKI_K_FastTestPointWeight as a function of calculated brake pedal position delta EWMA value is > 0.80	calculated brake pedal position delta sample counter > 50.00 for fast test OR calculated brake pedal position delta sample counter > 1,000.00 for slow test	calculated brake pedal position delta > 8.00 OR (for slow test) shift lever has been in park once this key cycle vehicle speed >= 5.00 accelerator pedal position < 5.00	total number of EWMA tests > 20.00	
			Calculated EWMA Value must be less than calibratable threshold after calibratable number of tests have completed to report a "test failed" for P057B. This test runs once per key cycle	EWMA value looked up in supporting table P057B KtBRKI_K_CmpltTestPointWeight as a function of calculated brake pedal position delta EWMA value is less thatn 0.40	no DTC's active (P057C, P057D)	shift lever has been in park once this key cycle vehicle speed >= 5.00 accelerator pedal position < 5.00	total number of EWMA tests > 2.00	

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Pedal Position Sensor Circuit Low	P057C	detects short to ground for brake pedal position sensor	If x of y samples are observed below failure threshold, default brake pedal position to zero percent.	5.00	Brake Pedal Position Sensore Low Voltage Diagnostic Enable	1.00	20 / 32.00 counts	MIL: Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Multi-function Circuit Low Voltage	P0580	detects short to ground failure for cruise multi-function switch circuit	Cruise Control analog circuit voltage must be in an "Open Short To Ground" 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 2.00 seconds	MIL: Type C, No MIL

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Multi-function Circuit High Voltage	P0581		Cruise Control analog circuit voltage must be in an "Short To Power" 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 2.00 seconds	MIL: Type C, No MIL

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 check sum is incorrect or the flash memory detects an uncorrectable error via the Error Correcting Code.	The Primary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1 failure if the fault is detected during the first pass. 5 failures if the fault occurs after the first pass is complete.			Diagnostic runs continuously in the background.	Type 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 OBDG08 ECM Summary Tables (Initial DTCs)

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 OBDG08 ECM Summary Tables (Initial DTCs)

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

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 >	0.47000 s			When dual store updates occur.	

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)	

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 recieved		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 recieved			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	

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_TestEnbld == 1 Value of KePISD_b_ALU_TestEnbld 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_ConfigRegTestEnbld == 1 Value of KePISD_b_ConfigRegTestEnbld is: 1 . (If 0, this test is disabled)	12.5 to 25 ms	
			Secondary processor detects an error in the toggling of a hardware discrete line controlled by the MAIN processor: number of discrete changes > = or < = over time window(50ms)	7 17		KePISD_b_MainCPU_SOH_FltEnbld == 1 Value of KePISD_b_ConfigRegTestEnbld is: 1 . (If 0, this test is disabled) time from initialization >= 0.4875 seconds	50 ms	
			Software background task first pass time to complete exceeds			Run/Crank voltage > 6.41	360.000 seconds	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			2 fails in a row in the MAIN processor's ALU check			KePISD_b_ALU_TestEnbld == 1 Value of KePISD_b_ALU_TestEnbld 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_ConfigRegTestEnbld == 1 Value of KePISD_b_ConfigRegTestEnbld is: 1 . (If 0, this test is disabled)	12.5 to 25 ms	
			Checks number of stack over/under flow since last powerup reset >=	3		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_CnvrtrTestEnbld == 1 Value of KePISD_b_A2D_CnvrtrTestEnbld 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 occured since last controller initialization. Counter >=	3 (results in MIL), 5 (results in MIL and remedial action)		KeMEMD_b_FlashECC_CktTestEnbl == 1 Value of KeMEMD_b_FlashECC_CktTestEnbl is: 1 . (If 0, this test is disabled)	variable, depends on length of time to access flash with corrupted memory	
			Checks for ECC (error	3 (results in MIL),		KeMEMD_b_RAM_ECC_	variable,	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			correcting code) circuit test errors reported by the hardware for RAM memory circuit. Increments counter during controller initialization if ECC error occured since last controller initialization. Counter >=	5 (results in MIL and remedial action)		CktTestEnbl == 1 Value of KeMEMD_b_RAM_ECC_ CktTestEnbl is: 1 . (If 0, this test is disabled)	depends on length of time to write flash to RAMvariable, depends on length of time to write flash to RAM	
			MAIN processor DMA transfer from Flash to RAM has 1 failure			KePISD_b_DMA_XferTest Enbld == 1 Value of KePISD_b_DMA_XferTest Enbld 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 the ECM main processor	
			MAIN processor	Previous seed value		KePISD_b_SeedUpdKey	Table, f(Loop	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			determines a seed has not changed within a specified time period within the 50ms task.	equals current seed value.		StorFltEnbl == 1 Value of KePISD_b_SeedUpdKey StorFltEnbl is: 1 . (If 0, this test is disabled)	Time). See supporting tables: **Last Seed Timeout f (Loop Time)**	

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module Fuel Injector Control Performance	P062B	This DTC Diagnoses the internal fuel injctor control module circuit for circuit faults.	Internal ECU Boost Voltage OR Internal ECU Boost Voltage OR Driver Status OR Driver Status	>= 90 Volts <= 40 Volts = Not Ready = Uninitialized	Battery Voltage	>= 8 or >= 11 Enabled when a code clear is not active or not exiting device control Engine is not cranking Powertrain Relay Voltage within range	High Voltage - 160 failures out of 200 samples Low Voltage - 160 failures out of 200 samples Driver Status Not Ready- 160 failures out of 200 samples Driver Status Uninitialized - Uninitialized state for >= 100 counts All at 12.5ms per sample	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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 B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

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 >	4.875 5.125 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

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	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	50 failures out of 63 samples 50 ms / sample	Type B, No MIL NO MIL Note: In certain controllers P263A may also set (MIL Control Short to Ground)

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 >	4.875 5.125 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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Control (ODM) Open	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 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0686 may also set (Powertrain Relay Control Short to Ground).

Component/ System	Fault Code	Monitor 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 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0685 may also set (Powertrain Relay Control Open Circuit).

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 failures out of 10 samples 250 ms / sample	Type B, 2 Trips

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	>= 4.00 volts will increment the fail counter	Powertrain relay commanded “OFF” No active DTCs:	>= 2.00 seconds PowertrainRelayStateOn_FA	50 failures out of 63 samples 100ms / Sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 1 Relay Control Circuit Low Voltage (ODM)	P0691	Diagnoses the cooling fan 1 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	Powertrain Relay Voltage	Voltage ≥ 11.00 volts	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips Note: In certain controllers P0480 may also set (Fan 1 Open Circuit).

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 1 Relay Control Circuit High Voltage (ODM)	P0692	Diagnoses the cooling fan 1 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	Powertrain Relay Voltage	Voltage ≥ 11.00 volts	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips

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 >	4.875 5.125 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

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 >	4.875 5.125 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 OBDG08 ECM Summary Tables (Initial DTCs)

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 Cumlative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow	Yes ≥ 2.0 seconds > 400 RPM and < 4,000 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 OBDG08 ECM Summary Tables (Initial DTCs)

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 Cumlative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow	Yes ≥ 2.0 seconds > 400 RPM and < 4,000 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 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Two Stage Oil Pump Control Circuit Open	P06DA	Diagnoses the two stage oil pump low side driver for open circuit fault	Voltage low during driver off state (indicates an open circuit)	Open Circuit ≥ 200 k Ω impedance between signal and controller ground	Diagnostic enabled/ disabled Powertrain Relay Voltage Run/Crank Active Cranking State	Enabled ≥ 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Two Stage Oil Pump Control Circuit Short To Ground	P06DB	Diagnoses the two stage oil pump low side driver for Short to Ground circuit fault	Voltage low during driver off state (indicates an short circuit to Ground)	Short to Ground Circuit ≤ 0.5 Ω impedance between signal and controller ground	Diagnostic enabled/ disabled Powertrain Relay Voltage Run/Crank Active Cranking State	Enabled ≥ 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Two Stage Oil Pump Control Circuit Short To Power	P06DC	Diagnoses the two stage oil pump low side driver for Short to Power circuit fault	Voltage low during driver on state (indicates an short to power)	Short to Power ≤ 0.5 Ω impedance between signal and controller power	Diagnostic enabled/ disabled Powertrain Relay Voltage Run/Crank Active Cranking State	Enabled ≥ 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Two Stage Oil Pump Control Circuit Performance	P06DD	Diagnoses the two stage oil pump is stuck in the high pressure state	Fail from passing state: Oil Pressure delta is less than a minimum delta pressure on a state change and the measured filtered oil pressure is above a threshold	Oil Pressure delta = ABS [Filtered Oil Pressure at beginning of state change - filtered oil pressure after 1.7 seconds] Oil Pressure delta ≤ **OP_StateChangeMin** (see P06DD details on Supporting Tables Tab) AND Filtered Oil Pressure ≥ (**OP_HiStatePressure** - **OP_LoStatePressure**) / 2	Common Criteria: Two Stage Oil Pump is Present Engine Running Ambient Air Pressure Oil Aeration (= TRUE if engine speed > 8,000 RPM for longer than 65,000.0 seconds) No active DTC's for diagnsotic enable: No active DTC's for control enable: Active Criteria: Oil Pump in Low State Modelled Oil Temperature within range	 TRUE ≥ 30.0 seconds ≥ 70.0 kPa FALSE Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA CrankSensorFA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA OilPmpTFTKO Enabled Fault bundles for control disable : OilPmpTFTKO EngineTorqueEstInaccurate EngOilPressureSensorFA PowertrainRelayFault CrankSensorFaultActive > 1.7 seconds 40.0 deg C ≤ Oil Temp ≤ 110.0 deg C	≥ 12 errors out of 15 samples. Run once per trip or activiated by the Passive Test	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Filtered Engine Speed within range	1,100 RPM ≤ Filtered Engine Speed ≤ 2,500 RPM		
					Engine Torque within range	**MinEnableTorque_OP** ≤ Indicated Requested Engine Torque ≤ **MaxEnableTorque_OP** (see P06DD details on Supporting Tables Tab)		
					Delta Filtered Engine Speed within a range	ABS [Filtered RPM at beginning of State change - Filtered RPM after 1.70 seconds] ≤ 250 RPM		
					<u>Passive Criteria:</u>			
					Active Test Passed	TRUE		
					Filtered Engine Speed within range	1,000 RPM ≤ Filtered Engine Speed ≤ 4,500 RPM		
					Modelled Oil Temperature within range	40.0 deg C ≤ Oil Temp ≤ 120.0 deg C		
					Delta Filtered Engine Speed within a range	ABS [Filtered RPM at beginning of State change - Filtered RPM after 1.70 seconds] ≤ 1,000 RPM		
					Oil Pressure Delta < **OP_StateChangeMin** (see P06DD details on Supporting Tables Tab)	TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Fast Pass Condition Oil Pressure delta is less than a minimum delta pressure on a state change and the measured filtered oil pressure is above a threshold	Oil Pressure delta = ABS [Filtered Oil Pressure at beginning of state change - filtered oil pressure after 1.7 seconds] Oil Pressure delta ≤ **OP_StateChangeMin** (see P06DD details on Supporting Tables Tab) AND Filtered Oil Pressure ≥ (**OP_HiStatePressure** - **OP_LoStatePressure**) / 2 (see P06DD details on Supporting Tables Tab)	Common Criteria: Two Stage Oil Pump is Present Engine Running Ambient Air Pressure Oil Aeration (= TRUE if engine speed > 8,000 RPM for longer than 65,000.0 seconds) No active DTC's for diagnsotic enable: No active DTC's for control enable: Active Criteria: Oil Pump in Low State	TRUE ≥ 30.0 seconds ≥ 70.0 kPa FALSE Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA CrankSensorFA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA OilPmpTFTKO Enabled Fault bundles for control disable : OilPmpTFTKO EngineTorqueEstInaccurate EngOilPressureSensorFA PowertrainRelayFault CrankSensorFaultActive > 1.7 seconds	0 errors out of 5 samples. Run once per trip or activiated by the Passive Test	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Modelled Oil Temperature within range Filtered Engine Speed within range Engine Torque within range Delta Filtered Engine Speed within a range	40.0 deg C ≤ Oil Temp ≤ 110.0 deg C 1,100 RPM ≤ Filtered Engine Speed ≤ 2,500 RPM **MinEnableTorque_OP** ≤ Indicated Requested Engine Torque ≤ **MaxEnableTorque_OP** (see P06DD details on Supporting Tables Tab) ABS [Filtered RPM at beginning of State change - Filtered RPM after 1.70 seconds] ≤ 250 RPM		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Traction Control Torque Request Circuit	P0856	Determines if torque request from the EBTCM is valid	Serial Communication 2's complement message - ($140 for PPEI2 or $1C9 for PPEI3, $1CA/$1C6 for Hybrid))	Message <> 2's complement of message	Serial communication to EBTCM (U0108) Power Mode Engine Running Status of traction in GMLAN message ($4E9)	No loss of communication = Run = True = Traction Present	>= 6 failures out of 10 Performed on every received message	Type C, No MIL Special Type C
			OR Serial Communication message ($140 for PPEI2 or $1C9 for PPEI3, $1CA/ $1C6 for Hybrid)) rolling count value	Message rolling count value <> previous message rolling count value plus one			6 rolling count failures out of 10 samples Performed on every received message	
			OR Too many minimum limit torque request transitions occur from TRUE to FALSE to TRUE within a time period	Requested torque intervention type toggles from not increasing request to increasing request			>= 3 multi-transitions out of 5 samples. Performed every 200 ms	
			Torque request greater than torque request diagnostic maximum threshold	> 250 Nm for engine based traction torque system, OR > 4,000 Nm for axle based traction torque system			>= 4 out of 10 samples Performed on every received message	

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

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	<= 250 kPa*(g/s) > 25.0 grams/sec > 22.0 kPa) > 22.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) No Active DTCs:	>= 450 RPM <= 5,400 RPM > -7 Deg C < 129 Deg C > -20 Deg C < 129 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 MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

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		

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 high side circuit	P1248	This DTC Diagnoses Injector 1 enable low side driver shorted to high side driver circuit faults.	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	Low side shorted to High Side: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 high side circuit	P1249	This DTC Diagnoses Injector 2 enable low side driver shorted to high side driver circuit faults.	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	Low side shorted to High Side: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 high side circuit	P124A	This DTC Diagnoses Injector 3 enable low side driver shorted to high side driver circuit faults.	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	Low side shorted to High Side: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 high side circuit	P124B	This DTC Diagnoses Injector 4 enable low side driver shorted to high side driver circuit faults.	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	Low side shorted to High Side: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 high side circuit	P124C	This DTC Diagnoses Injector 5 enable low side driver shorted to high side driver circuit faults.	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	Low side shorted to High Side: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 high side circuit	P124D	This DTC Diagnoses Injector 6 enable low side driver shorted to high side driver circuit faults.	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	Low side shorted to High Side: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 high side circuit	P124E	This DTC Diagnoses Injector 7 enable low side driver shorted to high side driver circuit faults.	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	Low side shorted to High Side: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 high side circuit	P124F	This DTC Diagnoses Injector 8 enable low side driver shorted to high side driver circuit faults.	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	Low side shorted to High Side: 25 amp >= through low side driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Driver Over Temperature	P1255	To detect if an internal fuel pump driver over-temperature condition exists under normal operating conditions	Fuel Pump Driver Overtemperature enumeration	== Faulted (as reported by Fuel Pmp Pwr Mod)	a) FPPM configuration KeFRPR_e_ChassisFuel PresSysType b) Diagnostic KeFRPR_b_FPPM_ OvertempDiagEnbld c] FPPM Driver Status Alive Rolling Count Sample Faulted d] Diagnostic feedback received e] System Voltage	a) == CeFRPR_e_ECM _FPPM_Sys b) == TRUE c] <> TRUE d] == TRUE e] 7V < System V < 32V	3 failures / 15 samples 1 sample / 12.5 millisec	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Pressure Sensor 2 Out of Range Low - Dual Sensor	P127C	This DTC Diagnoses High Pressure Sensor Out of Range Low	High Pressure Fuel Sensor 2	SIDI High Pressure Sensor 2 Out of range Enabled <= 5 % of 5Vref	Battery Voltage	>= 11 Volts Engine Running	Time Based Mode 400 failures out of 500 samples 6.25 ms Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Pressure Sensor 2 Out of Range High - Dual Sensor	P127D	This DTC Diagnoses High Pressure Sensor Out of Range High	High Pressure Fuel Sensor 2	SIDI High Pressure Sensor 2 Out of range Enabled >= 95 % of 5Vref	Battery Voltage	>= 11 Volts Engine Running	Time Based Mode 400 failures out of 500 samples 6.25 ms Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Driver Module- Ignition Switch Run/ Start Position Circuit Low	P129D	To detect if the Run/ Start position circuit voltage is short to low / open	FPPM Run_Crank Active status	<> ECM Run_Crank Active status	a) FPPM configuration KeFRPR_e_ChassisFuel PresSysType b) Diagnostic KeFRPR_b_FPPM_RunC rnkRatlEnbld c) FPPM Control Status Alive Rolling Count result d) Diagnostic feedback received e) System Voltage	a) == CeFRPR_e_ECM_FPPM _Sys b) == TRUE c) == Valid d) == TRUE e) >= 0.0 v	64 failures / 80 samples 1 sample / 12.5 millisec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Driver Control Module Signal Message Counter Incorrect	P129E	To detect if the command message received as serial data from the engine control module is valid	FPPM Received Duty Cycle Rolling Count	== enumeration faulted	a) FPPM configuration KeFRPR_e_ChassisFuelPresSysType b) Fault state determination enabled c) FPPM Received Duty Cycle Count result d) FPPM Diagnostic feedback received e) CAN communication f) System Voltage	a) == CeFRPR_e_ECM_FPPM_Sys b) == TRUE c) == Valid d) == TRUE e) == Valid f) 7v < Sys Voltage > 32v	64 failures / 80 samples 1 sample / 12.5 millisec	Type A, 1 Trips
			FPPM Received Duty Cycle Protection Value	== enumeration faulted	a) FPPM configuration KeFRPR_e_ChassisFuelPresSysType b) Fault state determination enabled c) FPPM Received Duty Cycle Protection Value result d) FPPM Diagnostic feedback received e) CAN communication f) System Voltage	a) == CeFRPR_e_ECM_FPPM_Sys b) == TRUE c) == Valid d) == TRUE e) == Valid f) 7v < Sys Voltage > 32v	64 failures / 80 samples 1 sample / 12.5 millisec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Driver Control Module Enable Circuit Performance	P12A6	To detect a driver control circuit signal stuck in normal operating range	FPPM Fuel Control Enable Active boolean	<> Fuel Control Enable variable (ECM)	a) FPPM configuration KeFRPR_e_ChassisFuelPresSysType b) Diagnostic KeFRPR_b_FPPM_FuelCntrlEnblEnbld c) FPPM Control Data Rolling Count result d) Diagnostic feedback received e) System Voltage	a) == CeFRPR_e_ECM_FPPM_Sys b) == TRUE c) == Valid d) == TRUE e) >= 7 v	40 failures / 80 samples 1 sample / 12.5 millisec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Control Status Signal Message Counter Incorrect	P12A8	To detect if the control status message transmitted as serial data from the driver control module is valid	FPPM Control Status Alive Rolling Count	== enumeration faulted	a) FPPM configuration KeFRPR_e_ChassisFuelPresSysType b) Fault state determination enabled c) FPPM Diagnostic feedback received	a) == CeFRPR_e_ECM_FPPM_Sys b) == TRUE c) == TRUE	64 failures / 80 samples 1 sample / 12.5 millisec	Type A, 1 Trips
			FPPM Power Consumption Alive Rolling Count	== enumeration faulted	a) FPPM configuration KeFRPR_e_ChassisFuelPresSysType b) Fault state determination enabled c) FPPM Diagnostic feedback received	a) == CeFRPR_e_ECM_FPPM_Sys b) == TRUE c) == TRUE	64 failures / 80 samples 1 sample / 12.5 millisec	
			FPPM Driver Status Alive Rolling Count	== enumeration faulted	a) FPPM configuration KeFRPR_e_ChassisFuelPresSysType b) Fault state determination enabled c) FPPM Diagnostic feedback received	a) == CeFRPR_e_ECM_FPPM_Sys b) == TRUE c) == TRUE	64 failures / 80 samples 1 sample / 12.5 millisec	
			FPPM Hardware Status Alive Rolling	== enumeration faulted	a) FPPM configuration KeFRPR_e_ChassisFuelPresSysType b) Fault state determination enabled c) FPPM Diagnostic feedback received	a) == CeFRPR_e_ECM_FPPM_Sys b) == TRUE c) == TRUE	64 failures / 80 samples 1 sample / 12.5 millisec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Ignition Coil Positive Voltage Circuit Group 1 * * SIDI ONLY * *	P135A	This diagnostic checks for voltage supply to the Ignition Coils (applicable only for SIDI applications)	Common Enable Criteria		Diagnostic Enabled?	Yes	50 Failures out of 63 Samples 6.25 msec rate	Type A, 1 Trips
			Ignition Module Supply Voltage.	< 2.5 Volts				
			Three possible power supply sources for Ignition Coils: Case 1: Battery Case 2: Ignition Run/ Crank Case 3: PT Relay	Ignition Coil Power Source = (see corresponding case specific enable criteria below)	PT Relay			
			Case Specific Enable Criteria	Case 1: Battery	Delay starting at Key-On	5 Engine Revs		
				Case 2: Ignition Run/ Crank	Ignition Run/Crank Voltage	> 11.0 volts		
				Case 3: PT Relay	PT Relay Voltage	> 11.0 volts		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Ignition Coil Positive Voltage Circuit Group 2 * * SIDI ONLY * *	P135B	This diagnostic checks for voltage supply to the Ignition Coils (applicable only for SIDI applications)	Common Enable Criteria		Diagnostic Enabled?	Yes	50 Failures out of 63 Samples 6.25 msec rate	Type: Type A, 1 Trips
			Ignition Module Supply Voltage.	< 2.5 Volts				
			Three possible power supply sources for Ignition Coils: Case 1: Battery Case 2: Ignition Run/ Crank Case 3: PT Relay	Ignition Coil Power Source = (see corresponding case specific enable criteria below)	PT Relay			
			Additional Case Specific Enable Criteria	Case 1: Battery	Delay starting at Key-On	5 Engine Revs		
				Case 2: Ignition Run/ Crank	Ignition Run/Crank Voltage	> 11.0 volts		
				Case 3: PT Relay	PT Relay Voltage	> 11.0 volts		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cold Start Emissions Reduction System Fault	P1400	Model based test computes power from exhaust flow and thermal energy resulting from elevated idle speed and retarded spark advance. Detects if the cold start emission reduction system has failed resulting in the delivered power being out of range.	Average desired accumulated exhaust power - Average actual accumulated exhaust power (too much energy delivered to catalyst) Average desired accumulated exhaust power - Average actual accumulated exhaust power (too little energy delivered to catalyst) (EWMA filtered) Average Power = output of **P1400_EngineSpeedResidual_Table** * output of **P1400_SparkResidual_Table** NOTE: Desired accumulated power would use the desired catalyst light off spark and desired engine speed and the actual accumuated power would use the final commanded spark and actual engine speed. Refer to the Supporting Tables for details	< -32.00 KJ/s (high RPM failure mode) > 3.50 KJ/s (low RPM failure mode)	To enable the diagnostic, the Cold Start Emission Reduction Strategy must be Active per the following: Catalyst Temperature AND Engine Coolant AND Engine Coolant AND Barometric Pressure The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following: Catalyst Temperature AND Engine Run Time OR Engine Run Time OR Barometric Pressure	< 300.00 degC > 17.00 degC <= 43.00 degC >= 75.00 KPa >= 800.00 degC >= 1.00 seconds > **CatalystLightOffExtendedEngineRunTimeExit** This Extended Engine run time exit is a function of percent ethanol and Catmons NormRatioEWMA. Refer to "Supporting Tables" for details. < 75.00 KPa	Runs once per trip when the cold start emission reduction strategy is active Frequency: 100ms Loop Test completes after 10 seconds of accumulated qualified data.	EWMA Based - Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Other Enable Criteria: OBD Manufacturer Enable Counter Vehicle Speed Allow diagnostic to calculate residual in an off-idle state. If the value of the OffIdleEnable is equal to 1 then the "DriverOffAccelPedal" will not be checked. However, if the value of OffIdleEnable is 0 then driver must be off the accel pedal A change in throttle position (tip-in/tip-out) will initiate a delay in the calculation of the average qualified residual value. Therefore when the: Pedal Close Delay Timer the diagnostic will continue the calculation. A change in gear will initiate a delay in the calculation of the average qualified residual value to allow time for the actual	0 < 1.86 MPH 0 (A value of 1 allows diagnostic to run and calculate the residual while off idle. A value of 0 requires calculation of the residual at idle) > 2.00 seconds		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					engine speed and actual final commanded spark to achieve their desired values. Therefore, when the: Gear Shift Delay Timer the diagnostic will continue the calculation For Manual Transmission vehicles: Clutch Pedal Position Clutch Pedal Position The diagnostic will delay calculation of the residual value and potentially weight the residual calculation differently based on engine run time. This is to ensure the diagnostic is operating in idle speed control as well as during the peak catalyst light off period. The time weighting factor must be :	 > 1.50 seconds > 12.00 % < 75.00 % > 0 These are scalar values that are a function of engine run time. Refer to **ColdStartDiagnosticDelayBasedOnEngineRunTime**		

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

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Engine Speed Request Circuit	P150C	Determines if engine speed request from the TCM is valid	Serial Communication rolling count value	+ 1 from previous $19D message (PTEI3)	Diagnostic enable bit	1	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
			Transmission engine speed protection	not equal to 2's complement of transmission engine speed request + Transmission alive rolling count	Engine run time	0.50 sec		
					# of Protect Errors	12 protect errors within the sample period 20		
					# of Alive Rolling Errors	6 rolling count errors out of 10 samples		
					No idle diagnostic 506/507 code	IAC_SystemRPM_FA		
					No Serial communication loss to TCM	(U0101)		
					Engine Running	= TRUE		
					Power mode	Run Crank Active		

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 inablity 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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Switch State Undetermined	P155A	Detects when cruise switch state cannot be determined, such as low voltage conditions	cruise switch state remains undetermined for greater than a calibratable time				fail continuously for greater than 0.5 seconds	MIL: Type C, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module SIDI High Pressure Pump current monitor	P163A	This DTC Diagnoses the current from the control area and compares it with calibrated thresholds to set current high and low flags	SIDI fuel pump High Current Test Current SIDI fuel pump Low Current Test Current	 >= 14.00 Amps <= 0.10 Amps	Battery Voltage Low Side Fuel Pressure Engine Run Time Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false andEngine movement	>= 11 Volts > 0.275 MPa >= KtFHPD_t_PumpCntrlEngRunThrsh (see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Current High - 750 failures out of 938 samples Current Low - 750 failures out of 938 Samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active and Barometric Pressure Inlet Air Temp Fuel Temp	 >= 70.0 KPA >= -10.0 degC -10 <= Temp degC <= 100		

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
TPS SENT Comm Circuit Low	P16A0	Detects a Low Circuit Fault in the TPS SENT Communication Circuit	Voltage for wave pulse is below state threshold as defined by SAE J2716 SENT Protocol	0.5 V		Run/Crank voltage > 6.41	79 / 159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
TPS SENT Comm Circuit High	P16A1	Detects a High Circuit Fault in the TPS SENT Communication Circuit	Voltage for wave pulse is above state threshold as defined by SAE J2716 SENT Protocol	4.1 V		Run/Crank voltage > 6.41	79 / 159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
TPS SENT Comm Circuit Performance	P16A2	Detects a Message Fault in the TPS SENT Communication Circuit	Message Pulse < Message Pulse > or Message Age Limit >= or Signal CRC fails	0.125977 ms 0.209991 ms 3.125 ms		Run/Crank voltage > 6.41	79 / 159 counts; 57 counts continuous; 3.125 ms /count in the ECM main processor	Type A, 1 Trips

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	Detect Processor Calculation faults due to RAM corruptions, ALU failures and ROM failures For all of the following cases: If the individual diagnostic threshold is equal to 2048 ms, this individual case is not applicable. If any of the following cases are X out of Y diagnostics and the fail (x) is greater than the sample (Y), this individual case is also not applicable.	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 multipier	Type A, 1 Trips
			Equivance Ratio torque compensation exceeds threshold	-94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference between Equivance Ratio torque compensation and its dual store out of bounds given by threshold	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of Accessory torque and its redundant calculation is out of bounds given by threshold range	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

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	59.03 mg	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference between the previous Final Advance and the current Final Advance not Adjusted for Equivalence Ratio is out of bounds given by threshold range	5.13 degrees		Engine speed >0rpm	Up/down timer 158 ms continuous, 0.5 down time multipier	
			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	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				Low Threshold 0.00 Nm			multipier	
			One step ahead calculation of air-per-cylinder and two step ahead is greater than threshold	80.00 mg		Engine speed > 500 rpm	Up/down timer 458 ms continuous, 0.5 down time multipier	
			Difference between Unmanaged Spark and PACS Spark is greater than threshold	10.00 degrees	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded Predicted Engine Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							multipier	
			Zero pedal axle torque is out of bounds given by threshold range	High Threshold 1,599.00 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Creep Coast Axle Torque is out of bounds given by threshold range	High Threshold 1,599.00 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Absolute difference of Friction torque and its redundant calculation is out of bounds given by threshold range	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	

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

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 158 ms continuous, 0.5 down time multipier	
			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 multipier	
			Commanded engine torque due to slow actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			TOS to wheel speed conversion factor is out of bounds given by threshold	High Threshold: 1.10	Ignition State	Accessory, run or crank	255 / 6 counts; 25.0msec/count	

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				
			Cylinders active greater than commanded	2 cylinders		Engine run flag = TRUE > 2.00 s Number of cylinder events since engine run > 24 No fuel injector faults active	Up/down timer 158 ms continuous, 0.5 down time multipier	
			Transfer case neutral request from four wheel drive logic does not match	N/A	Ignition State	Accessory, run or crank	32 / 0 counts; 25.0msec/count	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			with operating conditions			Transfer case range valid and not over-ridden FWD Apps only		
			Driver progression mode and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Predicted torque for uncorrected zero pedal determination is greater than calculated limit.	Table, f(Engine, Oil Temp). See supporting tables + 94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Engine Predicted Request Without Motor is greater than its redundant calculation plus threshold	93.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine Immediate Request Without Motor is greater than its redundant calculation plus threshold	93.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Positive Torque Offset is greater than its redundant calculation plus threshold OR Positive Torque Offset is less than its redundant calculation minus threshold	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Commanded Predicted Engine Request is greater than its redundant calculation plus threshold	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, down time multipier 0.5	
			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 multipier	
			Commanded Hybrid	4,096.00	Ignition State	Accessory, run or crank	Up/down timer	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Immediate Crankshaft Request is less than its redundant calculation minus threshold	Nm			2,048 ms continuous, 0.5 down time multipier	
			Regeneration Brake Assist is not within a specified range	Brake Regen Assist < 0 Nm or Brake Regen Assist > 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Cylinder Spark Delta Correction exceeds the absolute difference as compared to Unadjusted Cylinder Spark Delta	10.00 degrees	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			1. Cylinder Torque Offset exceeds step size threshold OR 2. Sum of Cylinder Torque Offset exceeds sum threshold	1. 94.00 Nm 2. 94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Engine Capacity Minimum Immediate Without Motor is greater than its dual store plus threshold	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine Capacity Minimum Engine Off is greater than threshold	0 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			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 multipier	
			Commanded Immediate Engine Request is greater than its redundant calculation plus threshold	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine Speed Lores Intake Firing (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 multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine Speed Lores Intake Firing timing (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 multipier	
			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)** + 94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	Table, f(Oil Temp, RPM). See supporting tables: **Speed Control External Load f(Oil Temp, RPM)** + 94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Difference between Driver Requested Immediate Torque primary path and its secondary exceeds threshold	1,599.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Driver Immediate Request is less than its redundant calculation minus threshold	1,599.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded Immediate Request is greater than its redundant calculation plus threshold OR Commanded Immediate	1,599.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Request is less than its redundant calculation minus threshold					
			Commanded Immediate Response Type is set to Inactive	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Difference between Cruise Axle Torque Arbitrated Request and Cruise Axle Torque Request exceeds threshold	199.88 Nm		Cruise has been engaged for more than 4.00 seconds	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Desired engine torque request greater than	93.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			redundant calculation plus threshold				ms continuous, 0.5 down time multipier	
			Engine min capacity above threshold	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 78 ms continuous, 0.5 down time multipier	
			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 158 ms continuous, 0.5 down time multipier	
			Absolute difference of adjustment factor based on temperature and its dual store above threshold	2.76 m/s	Ignition State	Accessory, run or crank	Up/down timer 108 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			1. Absolute difference of redundant calculated engine speed above threshold	200 RPM		Engine speed greater than 0 RPM	Up/down timer 158 ms continuous, 0.5 down time multipier	
			After throttle blade pressure and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Speed Control's Preditcted Torque Request and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Engine oil temperature and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 258 ms continuous,	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							0.5 down time multipier	
			Desired throttle position greater than redundant calculation plus threshold	5.95 percent	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of the rate limited pre-throttle pressure and its redundant calculation greater than threshold	0.06 kpa	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Throttle desired torque above desired torque plus threshold	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Desired filtered throttle torque exceeds the threshold plus the higher of desired throttle torque or modeled throttle torque	94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque feedback proportional term is out of allowable range or its dual store copy does not match	High Threshold 47.00 Nm Low Threshold -47.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque feedback integral term magnitude or rate of change is out of allowable range or its dual store copy do not match	High Threshold 88.13 Nm Low Threshold	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				-94.00 Nm Rate of change threshold 5.88 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 94.00 Nm Low Threshold - 94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of torque desired throttle area and its redundant calculation is out of bounds given by threshold range	High Threshold 0.50 %	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				Low Threshold - 0.50 %			multipier	
			Difference of torque model coefficients and its redundant calculation is out of bounds given by threshold range	High Threshold 0.0001525 Low Threshold - 0.0001525	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Difference of base friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 94.00 Nm Low Threshold - 94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Accessory drive friction torque is out of bounds given by threshold range	High Threshold 94.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			AC friction torque is greater than commanded by AC control software or less than threshold limit	High Threshold 40.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of Oil temperature delta friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 94.00 Nm Low Threshold	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				- 94.00 Nm				
			Generator friction torque is out of bounds given by threshold range	High Threshold 94.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Supercharger friction torque is out of bounds given by threshold range	High Threshold 94.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			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 94.00 Nm Low Threshold -94.00 Nm Rate of change threshold 5.88 Nm/loop		Engine speed >0rpm MAF, MAP and Baro DTCs are false	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque error compensation is out of bounds given by threshold range	High Threshold 94.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Delta Torque Baro compensation is out of bounds given by threshold range	High Threshold 15.39 Nm Low Threshold -25.40 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			1. Difference of reserve torque value and its redundant calculation exceed threshold OR 2. Reserve request does not agree with operating conditions or Difference of final predicted torque and its redundant calculation exeed threshold OR 3. Rate of change of reserve torque exceeds threshold, increasing direction only	1. 93.00 Nm 2. N/A 3. 93.00 Nm 4. 93.00 Nm	3. & 4.: Ignition State	1. & 2.: Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 94.00 Nm 3. & 4.: Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			OR 4. Reserve engine torque above allowable capacity threshold					
			Engine Vacuum and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of the calculated Intake Manifold Pressure during engine event versus during time event is greater than threshold	Table, f(Desired Engine Torque). See supporting tables: **Delta MAP Threshold f(Desired Engine Torque)**		Engine speed >0rpm	Up/down timer 158 ms continuous, 0.5 down time multipier	
			Min. Axle Torque Capacity is greater than threshold	0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Driver Predicted Request	1,599.00	Ignition State	Accessory, run or crank	Up/down timer	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			is greater than its redundant calculation plus threshold OR Driver Predicted Request is less than its redundant calculation minus threshold	Nm			475 ms continuous, 0.5 down time multipier	
			Cold Delta Friction Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Predicted torque for zero pedal determination is greater than calculated limit.	Table, f(Oil Temp, RPM). See supporting tables: **Speed Control External Load f(Oil Temp, RPM)** + 94.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Commanded Predicted Axle Torque and its dual store do not match	1 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			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 multipier	
			Difference of Weighting factor for number of cylinders fueled and its redundant calculation is above threshold	0.26		Engine run flag = TRUE > 10.00 s	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Difference of minimum spark advance limit and its redundant calculation is out of bounds given by threshold range	5.13 degrees	Ignition State	Accessory, run or crank	Up/down timer 158 ms continuous, 0.5 down time multipier	
			Difference of commanded spark advance and adjusted delivered is out of bounds given by threshold range	5.13 degrees		Engine speed >0rpm	Up/down timer 158 ms continuous, 0.5 down time multipier	
			Absolute difference between Estimated Engine Torque and its dual store are above a threshold	94.00 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference between Estimated Engine Torque without reductions due to torque	94.00 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			control and its dual store are above a threshold				down time multipier	
			Difference of desired spark advance for managed torque and its redundant calculation is out of bounds given by threshold range	5.13 degrees		Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 94.00 Nm	Up/down timer 458 ms continuous, 0.5 down time multipier	
			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	94.00 Nm		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multipier	
			One step ahead calculation of air-per-cylinder greater than two	Threshold: Dynamically calculated based on current		Engine speed > 500 rpm	Up/down timer 458 ms continuous,	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			step ahead calculation by threshold for time	engine conditions Fault Pending Threshold: 100 ms			0.5 down time multipier	
			Rate limited cruise axle torque request and its dual store do not match within a threshold	199.88 Nm	Ignition State	Accessory, run or crank	Up/down timer 163 ms continuous, 0.5 down time multipier	
			1. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range OR 2. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions	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 multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			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	1,599.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded axle torque is less than its redundant calculation by threshold	2,398.50 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Preload timer and its redundant calculation do	N/A	Ignition State	Accessory, run or crank	Up/down timer 158	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			not equal			AFM apps only	ms continuous, 0.5 down time multipier	
			AC friction torque is greater than commanded by AC control software	40.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine Speed Lores Intake Firing (time based) calculation does not equal its redundant calculation	N/A		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of the calculated spark offset for equivalence ratio and its redundant cacluation is greater than a threshold	5.13 degrees		Engine speed >0rpm	Up/down timer 158 ms continuous, 0.5 down time multipier	
			Transmission Torque	N/A		Run or Crank = TRUE >	16 / 32	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Request cacluations do not equal their dual stores			0.50 s	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 multipier	
			Absolute difference of maximum throttle area and its redundant cacluation is greater than a threshold	15 mm2			Up/down timer 108 ms continuous, 0.5 down time multipier	
			Absolute difference of Desired TIAP and its redundant cacluation is greater than a threshold	5.00 kPa			Up/down timer 475 ms continuous, 0.5 down time multipier	
			Pedal learns and their redundant calculation do not equal		Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Throttle learns and their redundant calculation do not equal		Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Desired Throttle Position and its redundant calculation do not equal		Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Camshaft Actuator Solenoid Circuit Low–Bank 1	P2088	Diagnoses the VVT system high side driver circuit for circuit faults.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Short to ground: ≤ 0.5 Ω to a voltage source within the Vehicle Ground Voltage Range relative to PWRGND	System supply voltage is within limits. Output driver is commanded on, Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples250 ms / sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Camshaft Actuator Solenoid Circuit High – Bank 1	P2089	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	> 11.00 Volts	20 failures out of 25 samples250 ms / sample, continuous	Type B, 2 Trips

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 it's 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 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 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 <= 14 % for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 320 counts per 400 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 <= 200 >= -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 FuelTankPressureSnsrCkt_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

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 Idle Cruise Light Acceleration Heavy Acceleration (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 300 300 0 200 300		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					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 (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).	<= -140 (control min.= -150) -140 (control min.= -150) -390 (control min.= -400) -390 (control min.= -400) -390 (control min.= -400) > 765 mV 765 mV 765 mV 765 mV 765 mV		

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 it's 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 it's 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 <= 14 % for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 320 counts per 400 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).	>= 140 (control max.= 150) 140 (control max.= 150) 390 (control max.= 400) 390 (control max.= 400) 390 (control max.= 400) < 705 mV 705 mV 705 mV 705 mV 705 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

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	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. 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. 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	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 <= 14 % for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 320 counts per 400 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: Bank1 Fault Active criteria are replaced by the equivalent Bank2 Fault Active criteria. The diagnostic is enabled during: Deceleration Idle Cruise Light Acceleration Heavy Acceleration Minimum accumulated counts in each cell required before counters will increment for that cell: Deceleration Idle Cruise Light Acceleration Heavy Acceleration (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 enabled (i.e. those containing a "Yes" at the beginning of the Enable Conditions column), the fail counter will increment	 No No Yes Yes Yes 300 300 0 200 300	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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		“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.			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 greater than 900mV is an indication that the diagnostic is not capable of diagnosing in that cell).	 <= -140 (control min.= -150) -140 (control min.= -150) -390 (control min.= -400) -390 (control min.= -400) -390 (control min.= -400) > 765 mV 765 mV 765 mV 765 mV 765 mV		

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 it's 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 it's 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 <= 14 % for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 320 counts per 400 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).	>= 140 (control max.= 150) 140 (control max.= 150) 390 (control max.= 400) 390 (control max.= 400) 390 (control max.= 400) < 705 mV 705 mV 705 mV 705 mV 705 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

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 > OR Difference between modeled throttle position and measured throttle position >	5.95 percent 5.95 percent	TPS minimum learn is not active and Throttle is being Controlled and (Engine Running or Ignition Voltage > or Ignition Voltage >) Ignition voltage failure is false (P1682)	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 > 8.41)	15 counts; 12.5 ms/count in the primary processor	Type A, 1 Trips
			Throttle Position >	36.00 percent		Powertrain Relay voltage > 6.41 TPS minimum learn is active	11 counts; 12.5 ms/count in the primary processor	
			Throttle Position >	35.00 percent		Powertrain Relay voltage > 6.41 Reduced Power is True	11 counts; 12.5 ms/count in the primary processor	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Throttle Return to Default Performance	P2119	Throttle unable to return to default throttle position after de-energizing ETC motor.	(Normalized TPS1 Voltage > AND Normailzed TPS2 Voltage > On the main processor) OR (Normalized TPS1 Voltage < AND Normailzed TPS2 Voltage < On the main processor)	1.7560 1.7590 1.4340 1.4310		Throttle de-energized for Actuator, Controller, or Ignition Faults (P21104, P2100, P2101, P2102, P2103, P1682, P0068, P16F3) No TPS circuit faults PT Relay Voltage > 5.500 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	0.4969 s	Type C, No MIL
			(Normalized TPS1 Voltage > AND Normailzed TPS2 Voltage > On the main processor) OR (Normalized TPS1 Voltage < AND Normailzed TPS2 Voltage < On the main processor)	1.7560 1.7590 1.4340 1.4310		Throttle de-energized for Battery Saver Mode Engine not running No TPS circuit faults PT Relay Voltage > 5.500 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	1.5000 s	

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

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

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

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

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 >	6.797 % offset at min. throttle position with a linear threshold to 9.720 % 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	

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 faulst 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 faulst for # 3 & # 4 5V reference circuits (P06A3, P0697)	19 / 39 counts intermittent or 15 counts continuous, 12.5 ms/count in the main processor	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 high side circuit shorted to ground	P2147	This DTC Diagnoses Injector 1 high side driver circuit for circuit faults.	Voltage high across High Side Driver during On state indicates short to ground	Short to Ground: 25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 high side circuit shorted to power	P2148	This DTC Diagnoses Injector 1 high side driver circuit for circuit faults.	Voltage low across High side drive during off state indicates short to power.	Short to Power: ≤ 1 volt between signal and controller power	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 high side circuit shorted to ground	P2150	This DTC Diagnoses Injector 2 high side driver circuit for circuit faults.	Voltage high across High Side Driver during On state indicates short to ground	Short to Ground: 25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 high side circuit shorted to power	P2151	This DTC Diagnoses Injector 2 high side driver circuit for circuit faults.	Voltage low across High side drive during off state indicates short to power.	Short to Power: ≤ 1 volt between signal and controller power	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 high side circuit shorted to ground	P2153	This DTC Diagnoses Injector 3 high side driver circuit for circuit faults.	Voltage high across High Side Driver during On state indicates short to ground	Short to Ground: 25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 high side circuit shorted to power	P2154	This DTC Diagnoses Injector 3 high side driver circuit for circuit faults.	Voltage low across High side drive during off state indicates short to power.	Short to Power: ≤ 1 volt between signal and controller power	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 high side circuit shorted to ground	P2156	This DTC Diagnoses Injector 4 high side driver circuit for circuit faults.	Voltage high across High Side Driver during On state indicates short to ground	Short to Ground: 25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 high side circuit shorted to power	P2157	This DTC Diagnoses Injector 4 high side driver circuit for circuit faults.	Voltage low across High side drive during off state indicates short to power.	Short to Power: ≤ 1 volt between signal and controller power	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Speed Sensor Output (TCSS)	P2160	No activity in the TCSS Signal circuit	TCSS Raw Speed	≤ 50 RPM	Engine Torque Throttle Position Transmission gear Garage Shift PTO EngineTorqureInaccurate	60.0 ≤ N-M ≤ 8,191.8 8 ≤ % ≤ 99 Not in Park or Neutral Not active Not active Not a hybrid vehicle FALSE	≥ 5.0 sec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Speed Sensor Output (TCSS)	P2161	TCSS Circuit Signal Intermittent	TCSS Loop-to-Loop speed decrease OR TCSS Loop-to-Loop speed increase	≥ 475 RPM ≥ 225 RPM	Engine Speed TCSS Speed Transmission gear Garage Shift PTO P2160	≥ 1,000 RPM > 0 Not in Park or Neutral Not active Not active CrankSensor_FA = FALSE Not Fault Active	≥ 4.0 sec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 5 high side circuit shorted to ground	P216B	This DTC Diagnoses Injector 5 high side driver circuit for circuit faults.	Voltage high across High Side Driver during On state indicates short to ground	Short to Ground: 25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 5 high side circuit shorted to power	P216C	This DTC Diagnoses Injector 5 high side driver circuit for circuit faults.	Voltage low across High side drive during off state indicates short to power.	Short to Power: ≤ 1 volt between signal and controller power	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 high side circuit shorted to ground	P216E	This DTC Diagnoses Injector 6 high side driver circuit for circuit faults.	Voltage high across High Side Driver during On state indicates short to ground	Short to Ground: 25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 high side circuit shorted to power	P216F	This DTC Diagnoses Injector 6 high side driver circuit for circuit faults.	Voltage low across High side drive during off state indicates short to power.	Short to Power: ≤ 1 volt between signal and controller power	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

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 minmum learn window after multiple attempts to learn the minimum.	During TPS min learn on the Main processor, TPS Voltage > AND Number of learn attempts >	0.5740 10 counts		Run/Crank voltage > 6.41 TPS minimum learn is active No previous TPS min learn values stored in long term memory	2.0 secs	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 7 high side circuit shorted to ground	P217B	This DTC Diagnoses Injector 7 high side driver circuit for circuit faults.	Voltage high across High Side Driver during On state indicates short to ground	Short to Ground: 25 amp >= through High Side Driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 7 high side circuit shorted to power	P217C	This DTC Diagnoses Injector 7 high side driver circuit for circuit faults.	Voltage low across High side drive during off state indicates short to power	Short to Power: ≤ 1 volt between signal and controller power	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector high side circuit shorted to ground	P217E	This DTC Diagnoses Injector high side driver circuit for circuit faults.	Voltage high across High Side Driver during n state indicates short to ground	Short to round: 2 amp >= through High Side Driver	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 8 high side circuit shorted to power	P217F	This DTC Diagnoses Injector 8 high side driver circuit for circuit faults.	Voltage low across High side drive during off state indicates short to power	Short to Power: ≤ 1 volt between signal and controller power	Battery Voltage Engine Run Time	>= 11 Volts >= 0 Seconds P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	Type A, 1 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 1 / 2 Correlation	P2199	Detects a difference between the IAT and IAT2 sensors	ABS (IAT - IAT2)	> 55.0 deg C	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.00 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Bank 1 Air-Fuel Ratio Imbalance	P219A	This monitor determines if a cylinder-to-cylinder air-fuel ratio imbalance is present on bank 1.	Filtered Ratio > Note: The input to this metric is the pre catalyst oxygen sensor voltage. This voltage is used to generate a Variance metric that represents the statistical variation of the O2 sensor voltage over a given engine cycle. This metric is proportional to the air-fuel ratio imbalance (variance is higher with an imbalance than without). Multiple samples are collected in making a decision. The observed Variance is dependant on engine speed and load and so each result is normalized for speed and load by comparing it to a known "good system" result for that speed and load, and generating a Ratio metric. The Ratio metric is calculated by selecting the appropriate threshold calibration from a 17x17 table (Supporting Table "**Variance Threshold Bank1**") and subtracting it from the measured Variance. The result is then divided by a normalizer calibration from another 17 x 17 table	0.45 If the diagnostic has reported a failure on the prior trip, the Filtered Ratio must fall below 0.21 in order to report a pass. This feature prevents the diagnostic from toggling between failing and passing when the Filtered Ratio remains near the initial failure threshold of 0.45 .	System Voltage Fuel Level Engine Coolant Temperature Cumulative engine run time Diagnostic enabled at Idle (regardless of other operating conditions) Engine speed range Engine speed delta during a short term sample period Mass Airflow (MAF) range Cumulative delta MAF during a short term sample period Filtered MAF delta between samples Note: first order lag filter coefficient applied to MAF = 0.050 Air Per Cylinder (APC) APC delta during short term sample period Filtered APC delta between samples	no lower than 10.0 Volts for more than 0.2 seconds > 10.0 percent AND no fuel level sensor fault > -20 degrees C > 25.0 seconds No 800 to 3,750 RPM < 200 RPM 5 to 1,000 g/s < 5 g/s < 0.70 g/s 100 to 720 mg/cylinder < 90 mg/cylinder < 5.00 percent	Minimum of 1 test per trip, up to 4 tests per trip during RSR or FIR. The front O2 sensor voltage is sampled once per cylinder event. Therefore, the time required to complete a single test (when all enable conditions are met) decreases as engine speed increases. For example, 15.00 seconds of data is required at 1000 rpm while double this time is required at 500 rpm and half this time is required at 2000 rpm. This data is collected only when enable conditions are met, and as such significantly more operating time is required than is indicated above. Generally, a report will be	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			(Supporting Table "**Normalizer Bank1**"). This quotient is then multiplied by a quality factor calibration from a 17 x 17 table (Supporting Table "**Quality Factor Bank1**"). This result is referred to as the Ratio. Note that the quality factor ranges between 0 and 1 and represents robustness to false diagnosis in the current operating region. Regions with low quality factors are not used. Finally, a EWMA filter is applied to the Ratio metric to generate the Filtered Ratio malfunction criteria metric. Generally, a normal system will result in a negative Filtered Ratio while a failing system will result in a positive Filtered Ratio. The range of the Filtered Ratio metric is application specific since both the emissions sensitivity and relationship between imbalance and the Variance metric are application specific. Some applications may need to command a unique cam phaser value before performing the		Note: first order lag filter coefficient applied to APC = 0.050 Spark Advance Throttle Area (percent of max) Intake Cam Phaser Angle Exhaust Cam Phaser Angle Quality Factor (QF) QF calibrations are located in a 17x17 lookup table versus engine speed and load (Supporting Table "**Quality Factor Bank1**"). QF values less than “1” indicate that we don’t have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of Variance data. Fuel Control Status Closed Loop and Long Term FT Enabled for: AIR pump not on CASE learn not active EGR - no device control, no intrusive diagnostics EVAP - no device control, no intrusive diagnostics Engine OverSpeed	 5 to 55 degrees 0 to 200 percent 0 to 25 degrees 0 to 25 degrees >= 0.99 >= 1.2 seconds (Please see "**Closed Loop Enable Criteria**" and "**Long Term FT Enable Criteria**" in Supporting Tables)	made within 5 minutes of operation. For RSR or FIR, 8 tests must complete before the diagnostic can report.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			above calculations since cam phasing has been shown to have an impact on overall signal quality. This application Does Not Use this feature.		Protection Not Active Idle speed control normal PTO Not Active Injector base pulse width above min limit O2 Learned htr resistance Rapid Step Response (RSR): RSR will trigger if the Ratio result from the last test is AND it exceeds the last Filtered ratio by Once triggered, the filtered ratio is reset to: Fast Initial Response (FIR): FIR will trigger when an NVM reset or code clear occurs. Once triggered, the filtered ratio is reset to: No Fault Active for:	 = Valid (the O2 heater resistance has learned since NVM reset) >= 0.25 >= 0.30 0.10 0.10 EngineMisfireDetected_FA MAP_SensorFA MAF_SensorFA ECT_Sensor_FA TPS_ThrottleAuthorityDefaulted FuelInjectorCircuit_FA AIR System FA EvapExcessPurgePsbl_FA CamSensorAnyLocationFA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Bank 2 Air-Fuel Ratio Imbalance	P219B	This monitor determines if a cylinder-to-cylinder air-fuel ratio imbalance is present on bank 2.	Filtered Ratio > Note: See P219A for a detailed description of this failure metric. Some applications may need to command a unique cam phaser value before performing the above calculations since cam phasing has been shown to have an impact on overall signal quality. This application Does Not Use this feature.	0.70 If the diagnostic has reported a failure on the prior trip, the Filtered Ratio must fall below 0.60 in order to report a pass. This feature prevents the diagnostic from toggling between failing and passing when the Filtered Ratio remains near the initial failure threshold of 0.70 .	See Bank 1 (P219A) Secondary Parameters and Enable Conditions. Quality Factor (QF) QF calibrations are located in a 17x17 lookup table versus engine speed and load (Supporting Table "**Quality Factor Bank2**"). QF values less than “1” indicate that we don’t have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of Variance data. Rapid Step Response (RSR): RSR will trigger if the Ratio result from the last test is AND it exceeds the last Filtered ratio by Once triggered, the filtered ratio is reset to: Fast Initial Response (FIR): FIR will trigger when an NVM reset or code clear occurs. Once triggered, the filtered ratio is reset to:	>= 0.99 >= 0.40 >= 0.45 0.20 0.20	See Bank 1 info	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Performance (naturally aspirated)	P2227	Compares baro sensor to the calculated baro estimate (part throttle calculation or unthrottled MAP)	Difference between baro sensor reading and estimated baro when distance since last estimated baro update OR Difference between baro sensor reading and estimated baro when distance since last estimated baro update	 > 15.0 kPa <= 0.06 miles > 20.0 kPa > 0.06 miles	Engine Run Time No Active DTCs:	> 0.00 seconds AmbPresSnsrCktFA ECT_Sensor_Ckt_FA IAT_SensorFA MAF_SensorFA AfterThrottlePressureFA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA	320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips
			Barometric Pressure OR Barometric Pressure	< 50.0 kPa > 115.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	 > 5.0 seconds EngineModeNotRunTimerError MAP_SensorCircuitFA AAP_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Circuit Low (non-boosted applications)	P2228	Detects a continuous short to low or open in either the signal circuit or the BARO sensor.	BARO Voltage	< 40.0 % of 5 Volt Range (2.0 Volts = 51.0 kPa)	Engine Run Time	> 0.00 seconds	320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Circuit High (non-boosted applications)	P2229	Detects an open sensor ground or continuous short to high in either the signal circuit or the BARO sensor.	BARO Voltage	> 90.0 % of 5 Volt Range (4.5 Volts = 115.1 kPa)	Engine Run Time	> 0.00 seconds	320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Circuit Intermittent	P2230	Detects a noisy or erratic barometric pressure input	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current BARO reading - BARO reading from 12.5 milliseconds previous)	> 100 kPa 80 consecutive BARO samples			4 failures out of 5 samples Each sample takes 1.00 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Conductivity Out Of Range (water in fuel)	P2269	Detects the presence of High Conductivity Fuel (e.g. water in fuel) via a specific range of sensor frequency. High conductivity in the fuel causes a significant upward shift in the sensor's output frequency.	Flex Fuel Sensor Output Frequency	> 185 Hertz	Powertrain Relay	> 11.0 Volts	50 failures out of 63 samples 100 ms loop Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Signal Stuck Lean Bank 1 Sensor 2	P2270	This DTC determines if the post catalyst O2 sensor is stuck in a normal lean voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic is an intrusive test (during coast) which increases the delivered fuel to achieve the required rich threshold.	Post O2 sensor signal AND The Accumulated mass air flow monitored during the Stuck Lean Voltage Test	< 825 mvolts > 160 grams	No Active DTC's B1S2 DTC's Not active this key cycle System Voltage ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Pedal position Engine Airflow Closed loop integral Closed Loop Active Evap Ethanol	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, P013B, P013E, P013F, P2270 or P2271 10.0 < Volts = 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 ≤ 100.0 % 4 ≤ gps ≤ 20 0.75 ≤ C/L Int ≤ 1.08 = TRUE not in control of purge not in estimate mode	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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 1.0 seconds, and then the Force Cat Rich intrusive stage is requested. ========== During Stuck Lean test the following must stay TRUE or the test will abort: Commanded Fuel Crankshaft Torque	= enabled < 125.0 Nm = not active = not active ≥ 60.0 sec 600 ≤ ºC ≤ 900 = DFCO possible ========== 1,000 ≤ RPM ≤ 2,500 950 ≤ RPM ≤ 2,550 38.5 ≤ MPH ≤ 74.6 36.0 ≤ MPH ≤ 77.7 0.95 ≤ EQR ≤ 1.10 < 125.0 Nm		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Signal Stuck Rich Bank 1 Sensor 2	P2271	This DTC determines if the post catalyst O2 sensor is stuck in a normal rich voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic is an intrusive test which requests the DFCO mode to achieve the required lean threshold.	Post O2 sensor signal AND The Accumulated mass air flow monitored during the Stuck Rich Voltage Test	> 100 mvolts > 10.0 grams	No Active DTC's B1S2 DTC's Not Active this key cycle System Voltage ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Engine Speed Engine Airflow Vehicle Speed Closed loop integral Closed Loop Active Evap Ethanol	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, P013B, P013E, P013F or P2270 10.0 < Volts = 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 1,000 ≤ RPM ≤ 2,500 4 ≤ gps ≤ 20 38.5 ≤ MPH ≤ 74.6 0.75 ≤ C/L Int ≤ 1.08 = TRUE not in control of purge not in estimate mode	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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 ≥ 60.0 sec 600 ≤ ºC ≤ 900 DFCO possible = P2270 (and P2272 if applicable) = P013E (and P014A if applicable) = P013A (and P013C if applicable) ==========		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Signal Stuck Lean Bank 2 Sensor 2	P2272	This DTC determines if the post catalyst O2 sensor is stuck in a normal lean voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic is an intrusive test (during coast) which increases the delivered fuel to achieve the required rich threshold.	Post O2 sensor signal AND The Accumulated mass air flow monitored during the Stuck Lean Voltage Test	< 825 mvolts > 160 grams.	No Active DTC's B2S2 DTC's Not Active this key cycle System Voltage ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Pedal position Engine Airflow Closed loop integral Closed Loop Active Evap Ethanol	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, P013D, P014A, P014B, P2272 or P2273 10.0 < Volts = 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 ≤ 100.0 % 4 ≤ gps ≤ 20 0.75 ≤ C/L Int ≤ 1.08 = TRUE not in control of purge not in estimate mode	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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 1.0 seconds, and then the Force Cat Rich intrusive stage is requested. ========== During Stuck Lean test the following must stay TRUE or the test will abort: Commanded Fuel Crankshaft Torque	= enabled < 125.0 Nm = not active = not active ≥ 60.0 sec 600 ≤ ºC ≤ 900 = DFCO possible ========== 1,000 ≤ RPM ≤ 2,500 950 ≤ RPM ≤ 2,550 38.5 ≤ MPH ≤ 74.6 36.0 ≤ MPH ≤ 77.7 ========== 0.95 ≤ EQR ≤ 1.10 < 125.0 Nm		

14 OBDG08 ECM Summary Tables (Initial DTCs)

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Signal Stuck Rich Bank 2 Sensor 2	P2273	This DTC determines if the post catalyst O2 sensor is stuck in a normal rich voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic is an intrusive test which requests the DFCO mode to achieve the required lean threshold.	Post O2 sensor signal AND The Accumulated mass air flow monitored during the Stuck Rich Voltage Test	> 100 mvolts > 10.0 grams.	No Active DTC's B2S2 DTC's Not Active this key cycle System Voltage ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Engine Speed Engine Airflow Vehicle Speed Closed loop integral Closed Loop Active Evap Ethanol	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, P013D, P014A, P014B or P2272 10.0 < Volts = 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 1,000 ≤ RPM ≤ 2,500 4 ≤ gps ≤ 20 38.5 ≤ MPH ≤ 74.6 0.75 ≤ C/L Int ≤ 1.08 = TRUE not in control of purge not in estimate mode	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc = FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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 ≥ 60.0 sec 600 ≤ ºC ≤ 900 = DFCO possible = P2270 (and P2272 if applicable) = P013E (and P014A if applicable) = P013A (and P013C if applicable) ==========		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SIDI High Pressure Pump	P228C	This DTC Diagnoses the measured fuel rail pressure bias too low from desired fuel pressure.	Desired Pressure - Measure Pressure	>= 3.00 Mpa	Battery Voltage Low Side Fuel Pressure Engine Run Time Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) andCam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement	>= 11 Volts > 0.275 MPa >= KtFHPD_t_PumpCntrlEngRunThrsh (see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Pressure Error - 750 0 failures out of 938 samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active Barometric Pressure Inlet Air Temp Fuel Temp	 >= 70.0 KPA >= -10.0 degC -10 <=Temp degC <= 100		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SIDI High Pressure Pump	P228D	This DTC Diagnoses the measured fuel rail pressure bias too high from desired fuel pressure	Desired Pressure - Measure Pressure	<= -3.00 Mpa	Battery Voltage Low Side Fuel Pressure Engine Run Time Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and	>= 11 Volts > 0.275 MPa >= KtFHPD_t_PumpCntrlEngRunThrsh (see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Pressure Error - 750 failures out of 938 samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Engine movement detected is true andManufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active Barometric Pressure Inlet Air Temp Fuel Temp	 >= 70.0 KPA >= -10.0 DegC -10 <= Temp degC <= 100		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #1 CIRCUIT LOW	P2300	Diagnoses Cylinder #1 Ignition Control (EST) output driver circuit for a Short to Ground fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver high state (indicates short-to-ground)	 ≤ 100 Ω impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #1 CIRCUIT High	P2301	Diagnoses Cylinder #1 Ignition Control (EST) output driver circuit for a Short to Power fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver low state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #2 CIRCUIT Low	P2303	Diagnoses Cylinder #2 Ignition Control (EST) output driver circuit for a Short to Ground fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver high state (indicates short-to-ground)	 ≤ 100 Ω impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #2 CIRCUIT High	P2304	Diagnoses Cylinder #2 Ignition Control (EST) output driver circuit for a Short to Power fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver low state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #3 CIRCUIT Low	P2306	Diagnoses Cylinder #3 Ignition Control (EST) output driver circuit for a Short to Ground fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver high state (indicates short-to-ground)	 ≤ 100 Ω impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #3 CIRCUIT High	P2307	Diagnoses Cylinder #3 Ignition Control (EST) output driver circuit for a Short to Power fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver low state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #4 CIRCUIT Low	P2309	Diagnoses Cylinder #4 Ignition Control (EST) output driver circuit for a Short to Ground fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver high state (indicates short-to-ground)	 $\leq$ 100 Ω impedance between signal and controller ground	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #4 CIRCUIT High	P2310	Diagnoses Cylinder #4 Ignition Control (EST) output driver circuit for a Short to Power fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver low state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #5 CIRCUIT Low	P2312	Diagnoses Cylinder #5 Ignition Control (EST) output driver circuit for a Short to Ground fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage Low during driver high state (indicates short-to-ground)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #5 CIRCUIT High	P2313	Diagnoses Cylinder #5 Ignition Control (EST) output driver circuit for a Short to Power fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver low state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #6 CIRCUIT Low	P2315	Diagnoses Cylinder #6 Ignition Control (EST) output driver circuit for a Short to Ground fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver high state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #6 CIRCUIT High	P2316	Diagnoses Cylinder #6 Ignition Control (EST) output driver circuit for a Short to Power fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver low state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #7 CIRCUIT Low	P2318	Diagnoses Cylinder #7 Ignition Control (EST) output driver circuit for a Short to Ground fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver high state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #7 CIRCUIT High	P2319	Diagnoses Cylinder #7 Ignition Control (EST) output driver circuit for a Short to Power fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver low state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #8 CIRCUIT Low	P2321	Diagnoses Cylinder #8 Ignition Control (EST) output driver circuit for a Short to Ground fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver high state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
IGNITION CONTROL #8 CIRCUIT High	P2322	Diagnoses Cylinder #8 Ignition Control (EST) output driver circuit for a Short to Power fault	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver low state (indicates short-to-power)	 ≤ 100 Ω impedance between signal and controller power	Engine running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 100 msec rate	Type B, 2 Trips

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)	Message <> two's complement of message	Diagnostic enabled/ disabled	Enabled	>= 16 failures out of 20 samples.	Type B, 2 Trips
					Power Mode	= Run	Performed on every received message	
			OR					
			Rolling count error - Serial Communication message ($199 - PPEI3) rolling count value	Message <> previous message rolling count value + one	Ignition Voltage	> 6.41 volts	>= 6 Rolling count errors out of 10 samples.	
					Engine Running	= True	Performed on every received message	
			OR		Run/Crank Active	> 0.50 Sec		
			Range Error - Serial Communication message - ($199 - PTEI3) TCM Requested Torque Increase	> 600 Nm	No Serial communication loss to TCM (U0101)	No loss of communication	>= 6 range errors out of 10 samples. Performed on every received message	
			OR					
			Multi-transition error - Trans torque intervention type request change	Requested torque intervention type toggles from not increasing request to increasing request			>= 3 multi-transitions out of 5 samples. Performed every 200 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Power Off Timer Performance	P262B	This DTC determines if the hardware timer does not initialize or count properly. There are two tests to ensure proper functioning of the timer: Count Up Test (CUT) and Range Test (RaTe). Count Up Test (CUT): Verifies that the HWIO timer is counting up with the proper increment. Range Test (RaTe): When the run/crank is not active both the hardware and mirror timers are started. The timers are compared when module shutdown is initiated or run/crank becomes active.	Count Up Test: Time difference between the current read and the previous read of the timer Range Test: The variation of the HWIO timer and mirror timer is	> 1.50 seconds > 24.87 %.			Count Up Test: 4 failures out of 20 samples 1 sec / sample Continuous while run/crank is not active and until controller shutdown is initiated. Range Test: Once per trip when controller shutdown is initiated or run/crank becomes active.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump "A" Low Flow / Performance	P2635	This DTC detects degradation in the performance of the SIDI electronically regulated fuel system	Filtered fuel rail pressure error	<= Low Threshold (tabulated function of desired fuel rail pressure and fuel flow rate -- 15% of requested Target Pressure) OR >= High Threshold (tabulated function of desired fuel rail pressure and fuel flow rate -- 15% of requested Target Pressure) **(See Supporting Calibration Tables "P2635 Threshold High", "P2635 Threshold Low", "P2635 Threshold High Repass", "P2635 Threshold Low Repass", "P2635 Max Fuel Flow"**)	a] Fu Rail Pres Snsr Circuit Low Fault Active (DTC P018C) b] Fu Rail Pres Snsr Circuit High Fault Active (DTC P018D) c] Fu Rail Pres Snsr Perf Fault Active (DTC P018B) d] Fu Pump Circuit Low Fault Active (DTC P0231) e] Fu Pump Circuit High Fault Active (DTC P0232) f] Fu Pump Circuit Open Fault Active (DTC P023F) g] Reference Voltage Fault Status (DTC P0641) h] Fu Pump Driver Control Module Overtemperature Fault Active (DTC P1255) j] Barometric Pressure Signal Valid (PPEI $4C1) k] Engine run time l] Emissions Fuel Level Low (PPEI $3FB) m] Fu Pump Control Enabled	a] <> TRUE b] <> TRUE c] <> TRUE d] <> TRUE e] <> TRUE f] <> TRUE g] <> Active This Key h] <> TRUE j] == TRUE (for absolute fuel pressure sensor) k] >= 30 sec l] <> TRUE m] == TRUE	1 sample / 12.5 millisec	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					n] Fu Pump Control state p] System Voltage q] Fuel flow rate r] Fuel Pressure Control System	n] == Normal p] 11V< System V <32V q1] > 0.047 gram/sec AND q2] <= Max allowed fuel flow rate (function of desired pressure and system voltage)(typically 11-50 gram/sec) r1] Not responding to overperformance due to pressure buildup during Deceleration Fuel Cut Off OR r2] Not responding to a decreasing desired fuel pres commnad		

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	50 failures out of 63 samples 50 ms / sample	Type B, No MIL NO MIL Note: In certain controllers P0650 may also set (MIL Control Open Circuit)

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) High	P263B	Diagnoses the malfunction indicator lamp 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 Remote Vehicle Start is not active	Voltage ≥ 11 volts	4 failures out of 5 samples 50 ms / sample	Type B, No MIL NO MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Four Wheel Drive Low Switch Circuit	P2771	Fail Case 1: Continuous Open (Stuck Off) in the Four Wheel Drive Low Switch CircuitFail Case 2: Ground (Stuck On) in the Four Wheel Drive Low Switch Circuit	4WD Low Switch Transfer case gear ratio 4WD Low Switch Transfer case gear ratio	= TRUE ≥ 2.600 and ≤ 2.800 = FALSE ≥ 0.900 and ≤ 1.100	Engine Torque Engine Speed Ignition voltage Throttle position Transmission Temperature Engine Run time Vehicle Speed TPS_FA VehicleSpeedSensor_FA EngineTorqureInaccurate Transmission gear P0502, P0503, P0722, P0723, P215C, P2160, P2161, U0101 Clutch Transmission Input Speed Signal	30.0 ≤ N-M ≤ 8,191.8 1,000 ≤ RPM ≤ 5,500 9.0 ≤ Volts ≤ 32.00 3.0 ≤ % ≤ 99.0 -40.0 ≤ ºC ≤ 130.0 >= 10.0 Sec >= 5.00 Mph False False FALSE Not in Park, Reverse, or Neutral Not Fault Active Engaged (Manual transmission only) Valid (Automatic transmission only)	≥ 2.0 sec≥ 7.0 sec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Deactivation System Performance	P3400	Detects a “failed to deactivate” condition when Deactivation Mode is allowed:	ABS(Measured MAP – MAP Model 2) Filtered AND ((Measured MAP – MAP Model 2) filtered) (stored from previous all-Cylinder mode event) - ((Measured MAP – MAP Model 2) filtered) (current)	< -12 kPa > -12 kPa	<u>Diagnostic Enable Conditions:</u> ECT IAT Engine RPM Minimum total weight factor (all factors multiplied together) No Active DTC'sNo active DTC's for diagnsotic enable:	 > -7 and < 129 Deg C > -20 and < 129 Deg C > 450 and < 5,400 RPM >= 0.50 factor 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** * 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** * **Lag Filter Coeff (** 1.00) (For details see P3400 "Residual Weight Factor" tables on Supporting Tables Tab). MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA	320 cylinder deactivation lag residual failures out of 400 samples Performed every 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						CrankSensor_FA ECT_Sensor_FA IAT_SensorFA		
					No active DTC's Pending DTCs:for diagnsotic enable:	EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP		
					CYLINDER DEACTIVATION CONTROL ENABLE CONDITIONS: Conditions below must be met for >= 0.3 seconds before cylinder deactivation will begin in regular mode			
					Neutral Idle Mode (NI) operational checks Allowed in NI Time in NI NI mode shall be active Vehicle Speed for NI	 FALSE >= 1.0 seconds < 4.3 mph to Enter > 0.0 mph to Exit		
					Vehicle Speed based on PRNDL for NI = FALSE	**VCE_PRNDL_NI_Disables** (For details see P3400 tables on Supporting Tables Tab).		
					Engine RPM lower limit for NI	> 475 rpm		
					Transmission gear for NI = FALSE	**VCE_TransGear_DisablesNI** (For details see P3400 tables on Supporting Tables Tab)		
					Torque based AFM entry			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					conditions: NI Mode Active	Indicated Torque < **VCE_NormalMode_MaxTorque_Gr1 - Gr8** minus 10.0 Nm (For details see P3400 tables on Supporting Tables Tab)		
					<u>Normal Mode operational checks:</u>			
					Engine running (based on engine off time)	Maximum 45.0 or > **VCEStartUpDelayTime** seconds (For details see P3400 tables on Supporting Tables Tab).		
					Engine RPM	> **VCE_EngineRPM_LowerLmt +** 75 RPM AND < **VCE_EngineRPM_UpperLmt -** 200 RPM (For details see P3400 tables on Supporting Tables Tab).		
					Vehicle Speed (in Gear) Vehicle Speed (P/N)	>= 8.1 mph <= 5.0 mph		
					Vehicle Speed based on PRNDL	< **VCE_VehicleSpeed_PRNDL_Enable** (For details see P3400 tables on Supporting Tables Tab).		
					If TRUE, will enabled AFM only if transmission is not	Feature is TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					in a defaulted state.			
					Engine RPM PRNDL	> **VCE_EngineRPM_PRNDL_LowerLmt +** 75 RPM AND < **VCE_EngineRPM_PRNDL_UpperLmt -** 200 RPM (For details see P3400 tables on Supporting Tables Tab).		
					Engine coolant (deac)	>= 40 and <= 252 deg C		
					Ignition voltage	>= 11.0 volts		
					Engine Oil Temperature	>= 20 and <= 128 deg C		
					Engine Oil Pressure	>= 187 and <= 455 KPa		
					Oil pump intrusive test : (refer to P06DD and P06DE)	= FALSE		
					Oil aeration present	Aeration enabled by engine RPM > 3,100 for 10 second(s), disabled by engine RPM < 3,000 for 50 second(s)		
					Catalyst Warm up	Not active		
					POPD	Not active		
					Deceleration Fuel Cut Off	Not active		
					Fuel shut off (FSO) delay	Not Active >= 3 second(s)		
					Green Engine mode	Not Active		
					Pedal Position	< 48 pct		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Brake booster vacuum	>= 0 KPa		
					Transmission gear = FALSE	**VCE_TransGear_Disables** (For details see P3400 tables on Supporting Tables Tab).		
					Gear Shift	not currently in progress		
					4WD State	not = 4 low range		
					Time since last AFM mode event	>= 3 second(s)		
					After exiting AFM mode for max time, must be in all cylinder mode for	>= 60 second(s)		
					Tip in Bump	Not active		
					AFM is disabled at high percent ethanol	Ethanol concentration > 95 % disables AFM. Once disabled, ethanol concentration must be < 90 % to re-enable		
					If feature is enabled, AFM is allowed only when percent ethanol learn is not in progress	Feature is FALSE		
					AFIM diagnostic status	Not active		
					A/C clutch transition	Not currently in progress		
					ETC power management mode:	Not active		
					Heater performance:	Not in heater perforamnce		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						mode		
					Torque based AFM entry conditions:			
					ECO Mode Active	Indicated Torque < **VCE_ECOMode_MaxTorque_Gr1 - Gr8** minus **VCE_ECOMode_EnableTorqueHyst**		
					Normal Mode	Indicated Torque < **VCE_NormalMode_MaxTorque_Gr1 - Gr8** minus **VCE_NormalMode_EnableTorqueHyst** (For details see P3400 tables on Supporting Tables Tab).		
					IF DEACTIVATED, ANY OF THE CONDITIONS BELOW WILL FORCE CYLINDER REACTIVATION:			
					If deactivation mode is active for	>= 480 seconds		
					then reactivation will occur if:	>= 600 seconds		
					Deac mode active	or		
					Delta vacuum	> 5 or < -5 kPa		
					Vehicle Speed for NI exit	< 0 Kph		
					ETC Power management mode	Active		
					Converter overtemp protect	Active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Hot coolant mode	Active		
					Engine running	= False		
					Engine overspeed protection	Active		
					Engine metal overtemp protect	Active		
					Cat. temp low	Active		
					Four Wheel Drive	In low range		
					Engine misfire	Detected		
					Heater performance	Active		
					POPD Intrusive tests (see P2270-P2273, P013A-P014B)	Active		
					Torque based AFM exit conditions:			
					ECO Mode Active	Indicated Torque < **VCE_ECOMode_MaxTorque_Gr1 - Gr8** Nm		
					Normal Mode	Indicated Torque < **VCE_NormalMode_MaxTorque_Gr1 - Gr8** Nm (For details see P3400 tables on Supporting Tables Tab).		
					Ignition voltage	< 11 volts		
					Engine coolant	< 36 or > 256 Deg C		
					Vehicle speed	< 6.8 mph		
					Brake booster vacuum	< 0 kPa		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Engine oil temperature Pedal Position Piston Protection No active DTC's for control enable:	< 18 or > 130 Deg C > 50 % Active Fault Bundles: EngOilPressureSensorFA EnginePowerLimited CrankSensorTFTKO EngineTorqueEstInaccurate VehicleSpeedSensorError ECT_Sensor_FA BrakeBoosterVacuumValid IAT_SensorFA CylDeacDriverFault CylDeacSystemTFTKO MAP_EngineVacuumStatus PowertrainRelayFault CamSensorAnyLctnTFTKO OilPmpStuckHigh VCER_TorqueSecurity FourWheelDriveLowStateInvalid		

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Deactivation Solenoid Control Circuit/Open	P3401	Diagnoses cylinder 1 deactivation solenoid 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	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Deactivation Solenoid Control Circuit/Low	P3403	Diagnoses cylinder 1 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver off state (indicates an short circuit to Ground)	Short to Ground Circuit ≤ 0.5 Ω impedance between signal and controller ground	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Deactivation Solenoid Control Circuit/High	P3404	Diagnoses cylinder 1 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver on state (indicates an short to power)	Short to Power ≤ 0.5 Ω impedance between signal and controller power	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Deactivation Solenoid Control Circuit/Open	P3425	Diagnoses cylinder 4 deactivation solenoid 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	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Deactivation Solenoid Control Circuit/Low	P3427	Diagnoses cylinder 4 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver off state (indicates an short circuit to Ground)	Short to Ground Circuit ≤ 0.5 Ω impedance between signal and controller ground	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Deactivation Solenoid Control Circuit/High	P3428	Diagnoses cylinder 4 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver on state (indicates an short to power)	Short to Power ≤ 0.5 Ω impedance between signal and controller power	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 6 Deactivation Solenoid Control Circuit/Open	P3441	Diagnoses cylinder 6 deactivation solenoid 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	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 6 Deactivation Solenoid Control Circuit/Low	P3443	Diagnoses cylinder 6 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver off state (indicates an short circuit to Ground)	Short to Ground Circuit ≤ 0.5 Ω impedance between signal and controller ground	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 6 Deactivation Solenoid Control Circuit/High	P3444	Diagnoses cylinder 6 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver on state (indicates an short to power)	Short to Power ≤ 0.5 Ω impedance between signal and controller power	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 7 Deactivation Solenoid Control Circuit/Open	P3449	Diagnoses cylinder 7 deactivation solenoid 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	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 7 Deactivation Solenoid Control Circuit/Low	P3451	Diagnoses cylinder 7 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver off state (indicates an short circuit to Ground)	Short to Ground Circuit ≤ 0.5 Ω impedance between signal and controller ground	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 7 Deactivation Solenoid Control Circuit/High	P3452	Diagnoses cylinder 7 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver on state (indicates an short to power)	Short to Power ≤ 0.5 Ω impedance between signal and controller power	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Communication Bus A Off	U0073	This DTC monitors for a BUS A off condition	Bus off failures exceeds before the sample time of is reached	5 counts (equivalent to 0.06 seconds) 0.56 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds CAN hardware is bus OFF for	 Not Active on Current Key Cycle Enabled Not Active Not Active >= 11.00 or >= 6.41 = run = 0 (1 indicates enabled) = Active > 11.00 > 0.1125 seconds	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Communication Bus B Off	U0074	This DTC monitors for a BUS B off condition	Bus off failures exceeds before the sample time of is reached	5 counts (equivalent to 0.06 seconds) 0.56 seconds	General Enable Criteria: U0074 Normal CAN transmission on Bus B Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds CAN hardware is bus OFF for	 Not Active on Current Key Cycle Enabled Not Active Not Active >= 11.00 or >= 6.41 = run = 0 (1 indicates enabled) = Active > 11.00 > 0.1125 seconds	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With TCM	U0101	This DTC monitors for a loss of communication with the transmission control module	Message is not received from controller for Message $0AB Message $0BD Message $0C7 Message $0F9 Message $189 Message $199 Message $19D Message $1AF Message $1BE Message $1BF Message $1F5 Message $4C9	 ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is	 Not Active on Current Key Cycle Enabled Not Active Not Active >= 11.00 or >= 6.41 = run = 0 (1 indicates enabled) = Active > 11.00	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for U0101 TCM	> 0.4000 seconds Not Active on Current Key Cycle is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Transfer Case Control Module	U0102	This DTC monitors for a loss of communication with the transfer case control module	Message is not received from controller for Message $1CB Message $1CC	 ≥ 10.0 seconds ≥ 10.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is	 Not Active on Current Key Cycle Enabled Not Active Not Active >= 11.00 or >= 6.41 = run = 0 (1 indicates enabled) = Active > 11.00	Diagnostic runs in 12.5 ms loop	Type C, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for U0102 TCCM	> 0.4000 seconds Not Active on Current Key Cycle is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Anti-Lock Brake System (ABS) Control Module	U0121	This DTC monitors for a loss of communication with the Anti-Lock Brake System (ABS) Control Module (Non-OBD Module ID 243).	Message is not received from controller for Message $0C1 Message $0C5 Message $0D1 Message $1C6 Message $1C7 Message $1E9 Message $2F1 Message $2F9	 ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual	 Not Active on Current Key Cycle Enabled Not Active Not Active >= 11.00 or >= 6.41 = run = 0 (1 indicates enabled) = Active > 11.00	Diagnostic runs in 12.5 ms loop	Type C, No MIL "Special Type C"

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Network Management is not active for U0121 Anti-Lock Brake System Control Module	> 0.4000 seconds Not Active on Current Key Cycle is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Fuel Pump Driver Control Module	U18A2	This DTC monitors for a loss of communication with the Fuel Pump Driver Control Module on Bus B	Message is not received from controller for Message $0D5 Message $0D7	 ≥ 10.0 seconds ≥ 10.0 seconds	General Enable Criteria: U0074 Normal CAN transmission on Bus B Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is not active for	 Not Active on Current Key Cycle Enabled Not Active Not Active >= 11.00 or >= 6.41 = run = 0 (1 indicates enabled) =Active > 11.00 > 0.4000 seconds	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					U18A2 Fuel Pump Driver Control Module	Not Active on Current Key Cycle is present on the bus		

14 OBDG08 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Driver Control Module Lost Communication with ECM/PCM	U2616	To detect lost serial data communication from the power driver controller to the ECM	FPPM Received Serial Data Communication Status	== enumeration faulted	a) FPPM configuration KeFRPR_e_ChassisFuelPresSysType b) Fault state determination enabled c) Run_Crank status d) FPPM Control Status Alive Rolling Count result e) FPPM Diagnostic feedback received f) System Voltage	a) == CeFRPR_e_ECM_FPPM_Sys b) == TRUE c) == Active d) == Valid e) == TRUE f) 7v < Sys Voltage > 32v	64 failures / 80 samples 1 sample / 12.5 millisec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Deactivation Solenoid Control Circuit/Open	P3417	Diagnoses cylinder 3 deactivation solenoid 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	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Deactivation Solenoid Control Circuit/Low	P3419	Diagnoses cylinder 3 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver off state (indicates an short circuit to Ground)	Short to Ground Circuit ≤ 0.5 Ω impedance between signal and controller ground	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Deactivation Solenoid Control Circuit/High	P3420	Diagnoses cylinder 3 deactivation solenoid control low side driver circuit for circuit faults	Voltage low during driver on state (indicates an short to power)	Short to Power ≤ 0.5 Ω impedance between signal and controller power	Diagnostic enabled/ disabled Powertrain Relay Voltage Engine RPM	Enabled ≥ 11 volts ≥ 400 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips

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 mechanical transfer pump dual fuel tanks)	P0461	This DTC will detect a fuel sender stuck in range in the primary fuel tank.	********** Fuel Level in Primary and Secondary Tanks Remain in an Unreadable Range too Long ********** This subtest is used If fuel volume in primary tank is and fuel volume in secondary tank and remains in this condition for OR ********** After Refuel Event ********** If the secondary fuel volume changes by 10.0 liters from engine “off” to engine “on” the primary volume should change by 3.0 liters. OR ********** Distance Traveled without a Primary Fuel Level Change ********** Delta fuel volume change over an accumulated 50 miles.	 ≥ 29.4 liters < 3.0 liters 124 miles. < 3 liters	Engine Running No active DTCs: The shutdown primary tank volume + 3.0 liters must be	 VehicleSpeedSensor_FA < 29.4 liters	250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Output Speed Sensor (TOSS)	P0502	No activity in the TOSS circuit	TOSS Raw Speed	≤ 60 RPM	Engine Torque Minimum Throttle opening Engine Speed Ignition voltage PTO EngineTorqureInaccurate P0503	54.0 ≤ N-M ≤ 8,191.8 ≥ 8.0 % 1,500 ≤ RPM ≤ 6,500 9.0 ≤ Volts ≤ 32.00 not active KeETQC_b_MinTransRemedial = TRUE: MSFR_b_EngMisfDtctd_FA, MAFR_b_MAF_SnsrTFTKO, MAPR_b_MAP_SnsrTFTKO KeETQC_b_MinTransRemedial = FALSE: FULR_b_FuelInjCkt_TFTKO, MAFR_b_MAF_SnsrTFTKO, XOYR_b_SecurityFlt, Not failed this key cycle	≥ 4.5 sec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Output Speed Sensor (TOSS)	P0503	TOSS Signal Intermittent	Loop-to-Loop change in TOSS	≥ 350 RPM	Raw Output SpeedOutput Speed changeTime since transfer case range change Ignition voltage Engine Speed Vehicle Speed PTO	> 300 RPM for ≥ 2.0 sec ≤ 150 RPM for ≥ 2.0 sec ≥ 6.0 sec 9.0 ≤ Volts ≤ 32.00 200 ≤ RPM ≤ 7,500 for ≥ 5.0 seconds ≤ 511.99 MPH for ≥ 5.0 sec not active	≥ 3.3 sec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear 6 incorrect ratio	P0729	Detects when the N/V gear ratio indicates 6th gear but the Gear Position Sensor does not indicate 6th gear	Gear Position Sensor	≠ Gear 6	Gear Position Sensor learn status Ignition voltage Ignition voltage Engine Torque Inaccurate Engine actual torque Transmission output speed Throttle position Clutch pedal displacement If four wheel drive low AND Transmission gear ratio Transmission gear ratio If four wheel drive low AND Transmission gear ratio Transmission gear ratio The above conditions are met for DTC's Not Set	= Learned ≥ 9.00 volts ≤ 32.00 volts = False ≥ 50.00 Nm ≥ 120.00 rpm ≥ 8.00 Pct ≤ 10.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 0.48 ratio < 0.53 ratio ≥ 1.50 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 3.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P18C7 P18C8 P2771		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear 1 incorrect ratio	P0731	Detects when the N/V gear ratio indicates 1st gear but the Gear Position Sensor does not indicate 1st gear	Gear Position Sensor	≠ Gear 1	Gear Position Sensor learn status Ignition voltage Ignition voltage Engine Torque Inaccurate Engine actual torque Transmission output speed Throttle position Clutch pedal displacement If four wheel drive low AND Transmission gear ratio Transmission gear ratio If four wheel drive low AND Transmission gear ratio Transmission gear ratio The above conditions are met for DTC's Not Set	= Learned ≥ 9.00 volts ≤ 32.00 volts = False ≥ 50.00 Nm ≥ 120.00 rpm ≥ 8.00 Pct ≤ 10.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 2.59 ratio < 2.80 ratio ≥ 1.50 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 3.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P18C7 P18C8 P2771		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear 2 incorrect ratio	P0732	Detects when the N/V gear ratio indicates 2nd gear but the Gear Position Sensor does not indicate 2nd gear	Gear Position Sensor	≠ Gear 2	Gear Position Sensor learn status Ignition voltage Ignition voltage Engine Torque Inaccurate Engine actual torque Transmission output speed Throttle position Clutch pedal displacement If four wheel drive low AND Transmission gear ratio Transmission gear ratio If four wheel drive low AND Transmission gear ratio Transmission gear ratio The above conditions are met for DTC's Not Set	= Learned ≥ 9.00 volts ≤ 32.00 volts = False ≥ 50.00 Nm ≥ 120.00 rpm ≥ 8.00 Pct ≤ 10.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 1.69 ratio < 1.87 ratio ≥ 1.50 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 3.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P18C7 P18C8 P2771		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear 3 incorrect ratio	P0733	Detects when the N/V gear ratio indicates 3rd gear but the Gear Position Sensor does not indicate 3rd gear	Gear Position Sensor	≠ Gear 3	Gear Position Sensor learn status Ignition voltage Ignition voltage Engine Torque Inaccurate Engine actual torque Transmission output speed Throttle position Clutch pedal displacement If four wheel drive low AND Transmission gear ratio Transmission gear ratio If four wheel drive low AND Transmission gear ratio Transmission gear ratio The above conditions are met for DTC's Not Set	= Learned ≥ 9.00 volts ≤ 32.00 volts = False ≥ 50.00 Nm ≥ 120.00 rpm ≥ 8.00 Pct ≤ 10.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 1.24 ratio < 1.37 ratio ≥ 1.50 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 3.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P18C7 P18C8 P2771		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear 4 incorrect ratio	P0734	Detects when the N/V gear ratio indicates 4th gear but the Gear Position Sensor does not indicate 4th gear	Gear Position Sensor	≠ Gear 4	Gear Position Sensor learn status Ignition voltage Ignition voltage Engine Torque Inaccurate Engine actual torque Transmission output speed Throttle position Clutch pedal displacement If four wheel drive low AND Transmission gear ratio Transmission gear ratio If four wheel drive low AND Transmission gear ratio Transmission gear ratio The above conditions are met for DTC's Not Set	= Learned ≥ 9.00 volts ≤ 32.00 volts = False ≥ 50.00 Nm ≥ 120.00 rpm ≥ 8.00 Pct ≤ 10.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 0.95 ratio < 1.05 ratio ≥ 1.50 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 3.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P18C7 P18C8 P2771		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear 5 incorrect ratio	P0735	Detects when the N/V gear ratio indicates 5th gear but the Gear Position Sensor does not indicate 5th gear	Gear Position Sensor	≠ Gear 5	Gear Position Sensor learn status Ignition voltage Ignition voltage Engine Torque Inaccurate Engine actual torque Transmission output speed Throttle position Clutch pedal displacement If four wheel drive low AND Transmission gear ratio Transmission gear ratio If four wheel drive low AND Transmission gear ratio Transmission gear ratio The above conditions are met for DTC's Not Set	= Learned ≥ 9.00 volts ≤ 32.00 volts = False ≥ 50.00 Nm ≥ 120.00 rpm ≥ 8.00 Pct ≤ 10.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 0.70 ratio < 0.78 ratio ≥ 1.50 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 3.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P18C7 P18C8 P2771		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear 7 incorrect ratio	P076F	Detects when the N/V gear ratio indicates 7th gear but the Gear Position Sensor does not indicate 7th gear	Gear Position Sensor	≠ Gear 7	Gear Position Sensor learn status Ignition voltage Ignition voltage Engine Torque Inaccurate Engine actual torque Transmission output speed Throttle position Clutch pedal displacement If four wheel drive low AND Transmission gear ratio Transmission gear ratio If four wheel drive low AND Transmission gear ratio Transmission gear ratio The above conditions are met for DTC's Not Set	= Learned ≥ 9.00 volts ≤ 32.00 volts = False ≥ 50.00 Nm ≥ 120.00 rpm ≥ 8.00 Pct ≤ 10.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 0.40 ratio < 0.45 ratio ≥ 1.50 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 3.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P18C7 P18C8 P2771		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Skip Shift Solenoid Control Circuit Open (Manual Transmission Only)	P0803	Diagnoses the skip shift solenoid 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 Engine Speed	9 volts≤Voltage≤ 32 volts > 250 RPM	5 failures out of 6 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P080C may also set (Skip Shift Solenoid Circuit Short to Ground).

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Clutch Pedal Position Sensor Circuit Range / Performance	P0806	Detects if Clutch Pedal Position Sensor is Stuck in a range indicative of a vehicle NOT in gear, when the vehicle is determined to be in gear. Gear determination is made by verifying that the ratio of engine RPM versus Transmission Output Speed (N/TOS) represents a valid gear.	Filtered Clutch Pedal Position Error when the vehicle is determined to be in gear	> 20 %	N/TOS Ratio: Transfer Case: Vehicle speed: Engine Torque: Clutch Pedal Position: OR No Active DTCs:	Must match actual gear (i.e. vehicle in gear) Not in 4WD Low range > 1.9 MPH > **EngTorqueThreshold** (see Supporting Tables) < **ResidualErrEnableLow** (see Supporting Tables) > **ResidualErrEnableHigh** (see Supporting Tables) ClutchPstnSnsrCktHi FA ClutchPstnSnsrCktLo FA CrankSensor_FA Transmission Output Shaft Angular Velocity Validity VehicleSpeedSensor_FA	25 ms loop Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Clutch Pedal Position Sensor Circuit Low	P0807	Detects Continuous Circuit Out-of-Range Low or Open	Clutch Position Sensor Circuit for	< 0 % of Vref 50 counts out of 100 samples	Engine Not Cranking System Voltage No active DTCs:	> 9.0 Volts	25 ms loop Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Clutch Pedal Position Sensor Circuit High	P0808	Detects Continuous Circuit Out-of-Range High	Clutch Position Sensor Circuit for	> 100 % of Vref 20 counts out of 100 samples	Engine Not Cranking System Voltage No active DTCs:	> 9.0 Volts	25 ms loop Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Clutch Pedal Position Not Learned	P080A	Detects Invalid Clutch Pedal Fully Applied Learn Position values	Fully Applied Learn Position OR	< 9.0 % > 36.0 %	OBD Manufacturer's Enable Counter	= 0	250 ms loop Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Skip Shift Solenoid Control Circuit Low (Manual Transmission Only)	P080C	Diagnoses the skip shift solenoid 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 Engine Speed	9 volts≤Voltage≤ 32 volts > 250 RPM	5 failures out of 6 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0803 may also set (Skip Shift Solenoid Circuit Open Circuit).

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Skip Shift Solenoid Control Circuit High (Manual Transmission Only)	P080D	Diagnoses the skip shift solenoid 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 Engine Speed	9 volts≤Voltage≤ 32 volts > 250 RPM	5 failures out of 6 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Analog Mode Switch Circuit Low	P159F	This DTC will detect an analog mode switch input that is too low out of range.	Analog Mode Switch % of 5V range The normal operating range of the analog mode switch is: Switch depressed % of 5V range: Switch released % of 5V range:	< 24.3 % < 66.8 % ≥ 24.3 % < 94.1 % ≥ 72.8 %			200 failures out of 250 samples 25 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Analog Mode Switch Circuit High	P15A0	This DTC will detect an analog mode switch input that is too high out of range.	Analog Mode Switch % of 5V range The normal operating range of the analog mode switch is: Switch depressed % of 5V range: Switch released % of 5V range:	≥ 94.1 % < 66.8 % ≥ 24.3 % < 94.1 % ≥ 72.8 %			200 failures out of 250 samples 25 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Analog Mode Switch Performance	P15A1	This DTC will detect an analog mode switch input that is in an indeterminate range.	Fuel Saver Switch % of 5V is in an indeterminate range: The normal operating range of the fuel saver mode switch is: Switch depressed % of 5V range: Switch released % of 5V range:	66.8 % ≤ % of 5 volts < 72.8 % < 66.8 % ≥ 24.3 % < 94.1 % ≥ 72.8 %			200 failures out of 250 samples 25 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear Position Sensor Circuit A Low	P18C4	Detects when the Gear Position Sensor Circuit A is failed low	Sensor type used If sensor type = Direct Proportional and Gear Position Sensor A duty cycle If sensor type = Indrect Proportional and Gear Position Sensor A duty cycle	CeSPMI_e_VoltageDirectProp ≤ 9.00 Pct ≥ 9.00 Pct	 Ignition voltage Ignition voltage	 ≥ 9.00 volts ≤ 32.00 volts	≥ 3.00 seconds of fail time out of 5.00 seconds of sample time	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear Position Sensor Circuit A High	P18C5	Detects when the Gear Position Sensor Circuit A is failed high	Sensor type used If sensor type = Direct Proportional and Gear Position Sensor A duty cycle If sensor type = Indrect Proportional and Gear Position Sensor A duty cycle	CeSPMI_e_VoltageDirectProp ≥ 90.00 Pct ≤ 90.00 Pct	Ignition voltage Ignition voltage	≥ 9.00 volts ≤ 32.00 volts	≥ 3.00 seconds of fail time out of 5.00 seconds of sample time	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear Position Sensor Circuit B Low	P18C6	Detects when the Gear Position Sensor Circuit B is failed low	Sensor type used If sensor type = Direct Proportional and Gear Position Sensor B duty cycle If sensor type = Indrect Proportional and Gear Position Sensor B duty cycle	CeSPMI_e_VoltageDirectProp ≤ 9.00 Pct ≥ 9.00 Pct	 Ignition voltage Ignition voltage	 ≥ 9.00 volts ≤ 32.00 volts	≥ 3.00 seconds of fail time out of 5.00 seconds of sample time	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear Position Sensor Circuit B High	P18C7	Detects when the Gear Position Sensor Circuit B is failed high	Sensor type used If sensor type = Direct Proportional and Gear Position Sensor B duty cycle If sensor type = Indrect Proportional and Gear Position Sensor B duty cycle	CeSPMI_e_VoltageDirectProp ≥ 90.00 Pct ≤ 90.00 Pct	 Ignition voltage Ignition voltage	 ≥ 9.00 volts ≤ 32.00 volts	≥ 3.00 seconds of fail time out of 5.00 seconds of sample time	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear Position Sensor Range/ Performance	P18C8	Detects when the Gear Position Sensor A & B values indicate a location between shifter gates where the shifter cannot physically achieve	Gear Position Sensor A	≥ P18C8 Gear position sensor range/ performance (sensor A min area A) AND ≤ P18C8 Gear position sensor range/ performance (sensor A max area A) OR ≥ P18C8 Gear position sensor range/ performance (sensor A min area B) AND ≤ P18C8 Gear position sensor range/ performance (sensor A max area B) OR ≥ P18C8 Gear position sensor range/ performance (sensor A min area C) AND ≤ P18C8 Gear position sensor range/ performance (sensor A max area C) OR ≥ P18C8 Gear position sensor range/ performance (sensor A min area D)	Gear Position Sensor learn status Ignition voltage Ignition voltage	= Learned ≥ 9.00 volts ≤ 32.00 volts	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 2.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				AND ≤ P18C8 Gear position sensor range/ performance (sensor A max area D) OR ≥ P18C8 Gear position sensor range/ performance (sensor A min area E) AND ≤ P18C8 Gear position sensor range/ performance (sensor A max area E) OR ≥ P18C8 Gear position sensor range/ performance (sensor A min area F) AND ≤ P18C8 Gear position sensor range/ performance (sensor A max area F) Refer to "Transmission Supporting Tables" for details				
			**********	**********				
			Gear Position Sensor B	≤ Index [4] P18C8 Gear position sensor range/ performance (sensor B, area ABC)				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				OR ≥ Index [0] P18C8 Gear position sensor range/ performance (sensor B, area DEF) Refer to "Transmission Supporting Tables" for details				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear Position Sensor Indicates Incorrect Gear Ratio	P18C9	Detects when transmission is in neutral and Gear Position Sensor is not indicating neutral	Gear Position Sensor	= In Gear	Gear Position Sensor learn status Ignition voltage Ignition voltage Transmission output speed Clutch pedal displacement Engine speed DTCs not set	= Learned ≥ 9.00 volts ≤ 32.00 volts ≤ 10.00 rpm ≤ 10.00 pct ≥ 450.00 rpm TransmissionOutputRotationalStatusValidity ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6 P18C7 P18C8	≥ 3.00 seconds Once the above fail time is achieved then increment the fail counter once ≥ 2.00 fail counts	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Gear Position Sensor Not Learned	P18CA	Detects when the Gear Position Sensor has not been learned	Gear Position Sensor Learn status	= Not Learned	Manufacturer Enable Counter (MEC) Service learn timer The service learn timer will increment while a learn is in progress. If the learn is not completed in less than 120.00 seconds then the learn will abort	= 0 Counts = 0 seconds	Immediate Frequency 500ms	Type A, 1 Trips Note: MIL will be extinguished immediately once sensor is learned

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 2 Performance (For use on vehicles with mechanical transfer pump dual fuel tanks)	P2066	This DTC will detect a fuel sender stuck in range in the secondary fuel tank.	****************************** Fuel Level in Primary and Secondary Tanks Remain in an Unreadable Range too Long ****************************** This subtest is used If fuel volume in primary tank is and fuel volume in secondary tank is and remains in this condition for OR ****************************** Fuel Level is in a Readable Range for both Primary and Secondary Tanks too Long ****************************** This subtest is used Volume in primary tank is and volume in secondary tank is and remains in this condition for OR ****************************** Distance Traveled without a Secondary Fuel Level Change ****************************** If the vehicle is driven a	≥ 29.4 liters < 3.0 liters 124 miles < 29 liters > 3 liters 900 seconds	Engine Running No active DTCs: Volume in secondary tank	 VehicleSpeedSensor_FA ≥ 3.0 liters	250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			distance of 62 miles without the secondary fuel level changing by 3 liters, then the sender must be stuck.					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 2 Circuit Low Voltage (For use on vehicles with dual fuel tanks)	P2067	This DTC will detect a fuel sender stuck out of range low in the secondary fuel tank.	Fuel level Sender % of 5V range	< 10 %			100 failures out of 125 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 2 Circuit High Voltage (For use on vehicles with dual fuel tanks)	P2068	This DTC will detect a fuel sender stuck out of range low in the secondary fuel tank.	Fuel level Sender % of 5V range	> 60 %			100 failures out of 125 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Performance Traction Torque & Speed Request Circuit	P2548	Determines if torque and/or speed request from the EBTCM is valid	Protection error - Serial Communication message - ($1C8) Torque Request Speed Request OR Rolling count error - Serial Communication message ($1C8) rolling count value	 Message <> two's complement of message Message <> two's complement of message Message <> previous message rolling count value + one	Diagnostic enabled/ disabled Run/Crank Active Ignition Voltage No Serial communication loss to EBTCM (U0121)	Enabled > 0.50 seconds > 6.41 volts No loss of communication	Fail Threshold: >= 10 failures out of 20 samples Pass Threshold: >= 10 samples during key cycle. OR Fail Threshold >= 6 Rolling count errors out of 10 samples Performed on every received message	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Open Circuit - (PFI)	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 controllers P0261 may also set (Injector 1 Short to Ground)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Open Circuit - (PFI)	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 controllers P0264 may also set (Injector 2 Short to Ground)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Open Circuit - (PFI)	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 controllers P0267 may also set (Injector 3 Short to Ground)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Open Circuit - (PFI)	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 controllers P0270 may also set (Injector 4 Short to Ground)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 5 Open Circuit - (PFI)	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 controllers P0273 may also set (Injector 5 Short to Ground)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 Open Circuit - (PFI)	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 controllers P0276 may also set (Injector 6 Short to Ground)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 7 Open Circuit - (PFI)	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 controllers P0279 may also set (Injector 7 Short to Ground)

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 Implmentation	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 controllers P0282 may also set (Injector 8 Short to Ground)

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 controllers P0201 may also set (Injector 1 Open Circuit)

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

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 controllers P0202 may also set (Injector 2 Open Circuit)

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

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 controllers P0203 may also set (Injector 3 Open Circuit)

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

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 controllers P0204 may also set (Injector 4 Open Circuit)

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

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 controllers P0205 may also set (Injector 5 Open Circuit)

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

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 controllers P0206 may also set (Injector 6 Open Circuit)

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

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 controllers P0207 may also set (Injector 7 Open Circuit)

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

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 controllers P0208 may also set (Injector 8 Open Circuit)

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

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	NOTE: The information contained below applies to applications that use the Idle Catalyst Monitor Algorithm The 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 Lean and Rich A/F excursions 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 table (based on temp and exhaust gas flow)	Normalized Ratio OSC Value (EWMA filtered)	< 0.35	There must be a valid idle period. The criteria are: Driver must be off the accel pedal. This checks that the final accel pedal position (comprehending deadband and hysteresis) is essentially zero. Idle Speed Control System Is Active Vehicle Speed Engine speed Engine run time Tests attempted this trip The catalyst diagnostic has not yet completed for the current trip. Catalyst Idle Conditions Met Criteria is satified which includes the General Enable met and the Valid Idle Period	 < 1.24 MPH > 975 RPM for a minimum of 20 seconds since end of last idle period. > **CatmonMinEngineRunTimeToEnable** This is a function of Coolant Temperature, please see "Supporting Tables" for details. < 255	1 test attempted per valid idle period Minimum of 1 test per trip Maximum of 8 tests per trip Frequency: Fueling Related : 12.5 ms OSC Measurements: 100 ms Temp Prediction: 12.5ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		3. WorstPassing OSC value (based on temp and exhaust gas flow) Normalized Ratio Calculation = (1-2) / (3-2) A Normalized Ratio of 1 essentially represents a good part and a ratio of 0 essentially represents a very bad part.The Catalyst Monitoring Test is done during idle. Several conditions must be meet in order to execute this test. These conditions and their related values are listed in the secondary parameters area of this document. Refer to the **P0420_WorstPassing OSCTableB1** and **P0420_BestFailingOS CTableB1** table in the **Supporting Tables** tab for details			Criteria met, as well as: Green Converter Delay Induction Air Intrusive test(s): Fueltrim Post O2 EVAP EGROther vehicle functions: Power Take Off RunCrank Voltage Ethanol Estimation ECT Barometric Pressure Idle Time before going intrusive is Idle time is incremented if Vehicle speed Short Term Fuel Trim	 Not Active > -20 ° C < 250 ° C Not Active Not Active > 10.90 Volts NOT in Progress > 40 ° C < 129 ° C > 70 KPA < 50 Seconds < 1.24 MPH and the drivers foot is off accel pedal and the idle speed control system is active as identified in the Valid Idle Period Criteria section. > 0.90 < 1.21		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Predicted catalyst temp AND Engine Airflow for at least with a closed throttle time Also, in order to increment the WarmedUpEvents counter, either the vehicle speed must exceed the vehicle speed cal or the driver must NOT be off the accel pedal as stated in the Valid Idle Period Criteria section above.	> 420.00 degC > **CatmonMinAirflowForWarmCatalystDetermination** table (g/s) (refer to "Supporting Tables" tab) (Based on engine coolant at the time the WarmedUpEvents counter resets to 0.) 30 seconds < 180 seconds consecutively (closed throttle consideration involves having the driver off the accel pedal as stated in the Valid Idle Period Criteria Section) .		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Closed loop fueling (Please see "Closed Loop Enable Criteria" section of the "Supporting Tables" tab for details.)			
					PRNDL	Enabled in Drive Range on an Auto Transmission vehicle.		
					Idle Stable Criteria:	Must hold true from after Catalyst Idle Conditions Met to the end of test		
					MAF	> 4.00 g/s < 20.00 g/s		
					Predicted catalyst temperature	< 850 degC		
					Engine Fueling Criteria at Beginning of Idle Period The following fueling related must also be met from between 4 and 7 seconds after the Catalyst Idle Conditions Met Criteria has been met for at least 4 seconds prior to allowing intrusive control:			
					Number of pre-O2 switches	>= 2		
					Short Term Fuel Trim Avg	> 0.96 < 1.04		
					Rapid Step Response			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					(RSR) feature will initiate multiple tests: If the difference between current EWMA value and the current OSC Normalized Ratio value is and the current OSC Normalized Ratio value is Maximum RSR tests to detect failure when RSR is enabled. The diagnostic will not be enabled until the following has been met: PTO General Enable DTC's Not Set	 > 0.62 < 0.10 24 Not Active MAF_SensorFA MAF_SensorTFTKO AmbPresDfltdStatus IAT_SensorCircuitFA IAT_SensorCircuitTFTKO ECT_Sensor_FA O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA FuelTrimSystemB1_FA FuelTrimSystemB1_TFTKO		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						FuelTrimSystemB2_FA FuelTrimSystemB2_TFTKO EngineMisfireDetected_FA EvapPurgeSolenoidCircuit_FA IAC_SystemRPM_FA EGRValvePerformance_FA EGRValveCircuit_FA CamSensorAnyLocationFA CrankSensorFA TPS_Performance_FA EnginePowerLimited		

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	Note: The information below applies to applications that use the Idle Catalyst Monitor Algorithm The 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 Lean and Rich A/F excursions 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 table (based on temp and exhaust gas flow) 3. WorstPassing OSC	Normalized Ratio OSC Value (EWMA filtered)	< 0.35	There must be a valid idle period. The criteria are: Driver must be off the accel pedal. This checks that the final accel pedal position (comprehending deadband and hysteresis) is essentially zero. Idle Speed Control System Is Active Vehicle Speed Engine speed Engine run time Tests attempted this trip The catalyst diagnostic has not yet completed for the current trip. Catalyst Idle Conditions Met Criteria is satified which includes the General Enable met and	 < 1.24 MPH > 975 RPM for a minimum of 20 seconds since end of last idle period. > **CatmonMinEngineRunTimeToEnable** This is a function of Coolant Temperature, please see "Supporting Tables" for details. < 255	1 test attempted per valid idle period Minimum of 1 test per trip Maximum of 8 tests per trip Frequency: Fueling Related : 12.5 ms OSC Measurements: 100 ms Temp Prediction: 12.5ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		value (based on temp and exhaust gas flow) Normalized Ratio Calculation = (1-2) / (3-2) A Normalized Ratio of 1 essentially represents a good part and a ratio of 0 essentially represents a very bad part.The Catalyst Monitoring Test is done during idle. Several conditions must be meet in order to execute this test. These conditions and their related values are listed in the secondary parameters area of this document. Refer to the **P0430_WorstPassingOSCTableB2** and **P0430_BestFailingOSCTableB2** table in the **Supporting Tablestab** for details			the Valid Idle Period Criteria met, as well as: Green Converter Delay Induction Air Intrusive test(s): Fueltrim Post O2 EVAP EGROther vehicle functions: Power Take Off RunCrank Voltage Ethanol Estimation ECT Barometric Pressure Idle Time before going intrusive is Idle time is incremented if Vehicle speed Short Term Fuel Trim	 Not Active > -20 ° C < 250 ° C Not Active Not Active > 10.90 Volts NOT in Progress > 40 ° C < 129 ° C > 70 KPA < 50 Seconds < 1.24 MPH and the drivers foot is off accel pedal and the idle speed control system is active as identified in the Valid Idle Period Criteria section. > 0.90 < 1.21		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Predicted catalyst temp AND Engine Airflow for at least with a closed throttle time Also, in order to increment the WarmedUpEvents counter, either the vehicle speed must exceed the vehicle speed cal or the driver must NOT be off the accel pedal as stated in the Valid Idle Period Criteria section above. Closed loop fueling (Please see "Closed Loop Enable Criteria" section of	> 420.00 degC > **CatmonMinAirflowForWarmCatalystDetermination** table (g/s) (refer to "Supporting Tables" tab) (Based on engine coolant at the time the WarmedUpEvents counter resets to 0.) 30 seconds < 180 seconds consecutively (closed throttle consideration involves having the driver off the accel pedal as stated in the Valid Idle Period Criteria Section) .		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					the "Supporting Tables" tab for details.)			
					PRNDL	Enabled in Drive Range on an Auto Transmission vehicle.		
					Idle Stable Criteria:	Must hold true from after Catalyst Idle Conditions Met to the end of test		
					MAF	> 4.00 g/s < 20.00 g/s		
					Predicted catalyst temperature	< 850 degC		
					Engine Fueling Criteria at Beginning of Idle Period The following fueling related must also be met from between 4 and 7 seconds after the Catalyst Idle Conditions Met Criteria has been met for at least 4 seconds prior to allowing intrusive control:			
					Number of pre-O2 switches	>= 2		
					Short Term Fuel Trim Avg	> 0.96 < 1.04		
					Rapid Step Response (RSR) feature will initiate multiple tests:			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					If the difference between current EWMA value and the current OSC Normalized Ratio value is	> 0.62		
					and the current OSC Normalized Ratio value is	< 0.10		
					Maximum RSR tests to detect failure when RSR is enabled.	24		
					PTO	Not Active		
					General Enable DTC's Not Set	MAF_SensorFA MAF_SensorTFTKO AmbPresDfltdStatus IAT_SensorCircuitFA IAT_SensorCircuitTFTKO ECT_Sensor_FA O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA FuelTrimSystemB1_FA FuelTrimSystemB1_TFTKO FuelTrimSystemB2_FA FuelTrimSystemB2_TFTKO EngineMisfireDetected_FA EvapPurgeSolenoidCircuit_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						IAC_SystemRPM_FA EGRValvePerformance_FA EGRValveCircuit_FA CamSensorAnyLocationFA CrankSensorFA TPS_Performance_FA EnginePowerLimited		

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 electric transfer pump dual fuel tanks)	P0461	This DTC will detect a fuel sender stuck in range in the primary fuel tank.	****************************** Fuel Level in Primary and Secondary Tanks Remain in an Unreadable Range too Long ****************************** This subtest is not used If fuel volume in primary tank is and fuel volume in secondary tank is and remains in this condition for OR ****************************** During Fuel Transfer ****************************** During fuel transfer, when the enable conditions are met, at least 5.0 liters of fuel will be transferred from the secondary tank and 5.0 liters of fuel will be transferred into the primary tank within 500 seconds. There is a short delay of 20 seconds to allow fuel slosh to settle before the fail timer begins. If the secondary tank volume does decrease by the cal amount but the primary volume does not increase	≥ 1,024.0 liters < 0.0 liters 124 miles.	Engine Running No active DTCs: Transfer pump is commanded on for the maximum time limit referenced in **Transfer Pump Enable Time Table** (see Supporting Table) No device control for the transfer pump Fuel Volume in Secondary Tank Vehicle Speed	VehicleSpeedSensor_FA < 136 liters < 0 mph	250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			by the cal amount after the fail timer has expired, then P0461 sets. OR ********** Distance Traveled without a Primary Fuel Level Change ********** Delta fuel volume change over an accumulated 72 miles.	< 3 liters				

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 2 Performance (For use on vehicles with electric transfer pump dual fuel tanks)	P2066	This DTC will detect a fuel sender stuck in range in the secondary fuel tank.	****************************** Fuel Level in Primary and Secondary Tanks Remains in an Unreadable Range too Long ****************************** This subset is not used If fuel volume in primary tank is and fuel volume in secondary tank is and remains in this condition for OR ****************************** During fuel transfer ****************************** When the enable conditions are met, 5.0 liters of fuel will be transferred from the secondary tank and 5.0 liters of fuel will be transferred into the primary tank within 500 seconds. There is a short delay of 20 seconds to allow fuel slosh to settle before the fail timer begins. If the secondary tank volume does not	≥ 1,024.0 liters < 0.0 liters 124 miles	Engine Running No active DTCs: Transfer pump is commanded on for the maximum time limit referenced in **Transfer Pump Enable Time Table** (see Supporting Table) No device control for the transfer pump Fuel volume in secondary tank	VehicleSpeedSensor_FA < 136 liters	250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			decrease by the cal amount but the primary volume does increase by the cal amount after the fail timer has expired, then P2066 sets. OR ****************************** After a Refuel Event ****************************** If the primary fuel volume changes by 1,024 liters from engine "off" to engine "on" the secondary volume should change by 5 liters. Otherwise, P2066 will set. OR ****************************** Distance Traveled without a Secondary Fuel Level Change ****************************** If the vehicle is driven a distance of 103 miles without the secondary fuel level changing by 5 liters, then the sender must be stuck. OR ****************************** Stuck Above Secondary Full During Fuel Transfer ****************************** The secondary fuel level AND If the vehicle is driven a	> 136 liters	Vehicle Speed Volume in secondary tank Volume in secondary tank Secondary Fuel Transfer	< 0.0 mph ≥ 7 liters < 136 liters		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			distance of 103 miles without the secondary fuel level changing by 5 liters, then the sender must be stuck.		Pump On Time	≥ 1,200 seconds		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 2 Circuit Low Voltage (For use on vehicles with dual fuel tanks)	P2067	This DTC will detect a fuel sender stuck out of range low in the secondary fuel tank.	Fuel level Sender % of 5V range	< 10 %			100 failures out of 125 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 2 Circuit High Voltage (For use on vehicles with dual fuel tanks)	P2068	This DTC will detect a fuel sender stuck out of range low in the secondary fuel tank.	Fuel level Sender % of 5V range	> 60 %			100 failures out of 125 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Adaptive Cruise Control Signal Circuit	P1553	Detects rolling count or protection value errors in Adaptive Cruise Control Axle Torque Command serial data signal	If x of y rolling count / protection value faults occur, disable adaptive cruise control for duration of fault		Adaptive Cruise Control Command Serial Data Error Diagnostic Enable	1.00	10 / 16 counts	MIL: Type C, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Front Object Detection Control Module Torque Request Signal Message Counter Incorrect	P15F6	Detects rolling count or protection value errors in Collision Preparation System Axle Torque Command serial data signal	If x of y rolling count / protection value faults occur, disable collision preparation system for duration of fault		Front Object Detection Module Torque Request Serial Data Error Diagnostic Enable	1.00	4 / 10 counts	MIL: Type C, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Automatic Braking Engine Torque Request Signal Message Incorrect	P15F8	Detects rolling count or protection value errors Rear Virtual Bumper Axle Torque Command serial data signal	If x of y rolling count / protection value faults occur, disable rear virtual bumper or collision preparation system for duration of fault		Automatic Braking Engine Torque Request Serial Data Error Diagnostic Enable	1.00	4 / 10 counts	MIL: Type C, No MIL

14 OBDG08 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Chassis Control Module 1 Requested MIL Illumination	P26C8	Monitors the Chassis Contol Module 1 MIL request line to determine when the Chassis Control Module 1 has detected a MIL illuminating fault.	Chassis Control Module 1 Emissions-Related DTC set			Time since power-up ≥ 3 seconds	Continuous	Type A, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Chassis Control Module A	U012A	This DTC monitors for a loss of communication with the Chassis Control Module A.	Message is not received from controller for Message $4DB	≥ 10.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is	 Not Active on Current Key Cycle Enabled Not Active Not Active >= 11.00 or >= 6.41 = run = 0 (1 indicates enabled) = Active > 11.00	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for U012A CHCM A	> 0.4000 seconds Not Active on Current Key Cycle is present on the bus		

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 02 sensor voltage less than
KfFULC_U_O2_SensorReadyThrsh
Lo

Voltage < *XXXX* milliVolts

for
KcFULC_O2_SensorReadyEvents

Time (events * 12.5 milliseconds) > *XXXX* events

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 CylinderDeacDriverTFTKO = 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	> *XXXX*Celcius

or less than
KfFCLL_T_AdaptiveHiCoolant

Coolant	< *XXXX*Celcius

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	< *XXXX*milliVolts

for
KcFCLP_Cnt_O2RdyCyclesThrsh

Time (events * 12.5 milliseconds)	> *XXXX*events

Long Term Secondary Fuel Trim Enable Criteria

KtFCLP_t_PostIntglDisableTime

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 < *XXXX*Celcius
and
KeFCLP_T_IntegrationCatalystMin
Modeled Catalyst Temperature > *XXXX*Celcius
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

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	400	750	1,100	1,450	1,800	2,150	2,500	2,850	3,200	3,550	3,900	4,250	4,600	4,950	5,300	6,000
1	0.000	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	0.000

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	400	750	1,100	1,450	1,800	2,150	2,500	2,850	3,200	3,550	3,900	4,250	4,600	4,950	5,300	6,000
1	0.000	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	0.000

Supporting Table - P0101_P0106_P0121_P012B_P0236_P1101 MAP2 Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAP2 Residual Weight Factor based on RPM

Notes:

y/x	0	400	750	1,100	1,450	1,800	2,150	2,500	2,850	3,200	3,550	3,900	4,250	4,600	4,950	5,300	6,000
1	0.000	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	0.000

Supporting Table - P0071_OAT_Performance_Drive_Equilibrium_Engine_Running

Description: OAT Performance Diagnostic counter increment for determining OAT-IAT equilibrium for engine running

Notes:

y/x	0.0	20.0	30.0	45.0	60.0	75.0	90.0	105.0	120.0
0.0	1.0	5.0	7.0	7.5	8.0	9.0	9.0	9.0	9.0
15.0	-5.0	1.0	2.0	2.5	3.0	3.5	4.0	4.5	5.0
25.0	-4.0	1.0	2.0	2.5	3.0	3.5	4.0	4.5	5.0
35.0	-2.0	1.0	2.0	2.5	3.0	3.5	4.0	4.5	5.0
45.0	-1.0	2.0	3.0	3.5	4.0	4.5	5.0	5.5	6.0
55.0	0.0	2.0	3.0	3.5	4.0	4.5	5.0	5.5	6.0
65.0	0.0	3.0	4.0	4.5	5.0	5.5	6.0	6.5	7.0
75.0	0.0	4.0	5.0	5.5	6.0	6.5	7.0	7.5	8.0
85.0	1.0	5.0	6.0	6.5	7.0	7.5	8.0	8.5	9.0

Supporting Table - P0071_OAT_Performance_Drive_Equilibrium_Engine_Off

Description: OAT Performance Diagnostic counter increment for determining OAT-IAT equilibrium for engine off (for hybrid applications)

Notes:

y/x	0.0	20.0	30.0	45.0	60.0	75.0	90.0	105.0	120.0
1.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0

Supporting Table - P0101_P0106_P010B_P0121_P012B_P0236_P1101 MAF1 Residual Weight Factor based on RPM

Description: P0101_P0106_P010B_P0121_P012B_P0236_P1101 MAF1 Residual Weight Factor based on RPM

Notes:

y/x	0	400	750	1,100	1,450	1,800	2,150	2,500	2,850	3,200	3,550	3,900	4,250	4,600	4,950	5,300	6,000
1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0

Supporting Table - P0101_P0106_P010B_P0121_P012B_P0236_P1101 MAF1 Residual Weight Factor based on MAF Est

Description: P0101_P0106_P010B_P0121_P012B_P0236_P1101 MAF1 Residual Weight Factor based on MAF Est

Notes:

y/x	0	50	70	73	76	79	82	85	89	95	100	110	120	150	200	280	350
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Supporting Table - P18C8 Gear position sensor range/performance (sensor B, area ABC)

Description: Sensor B threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. These values are used with the following calibrations to define the invalid areas:

KtSPMI_Pct_SnsrPerfPstnX_MaxA
KtSPMI_Pct_SnsrPerfPstnX_MaxB
KtSPMI_Pct_SnsrPerfPstnX_MaxC
KtSPMI_Pct_SnsrPerfPstnX_MinA
KtSPMI_Pct_SnsrPerfPstnX_MinB
KtSPMI_Pct_SnsrPerfPstnX_MinC

Notes: KnSPMI_Pct_SnsrPerfPstnYAxis1

y/x	1	2	3	4	5
1	10	18	27	35	44

Supporting Table - P18C8 Gear position sensor range/performance (sensor B, area DEF)

Description: Sensor B threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. These values are used with the following calibrations to define the invalid areas:

KtSPMI_Pct_SnsrPerfPstnX_MaxD
KtSPMI_Pct_SnsrPerfPstnX_MaxE
KtSPMI_Pct_SnsrPerfPstnX_MaxF
KtSPMI_Pct_SnsrPerfPstnX_MinD
KtSPMI_Pct_SnsrPerfPstnX_MinE
KtSPMI_Pct_SnsrPerfPstnX_MinF

Notes: KnSPMI_Pct_SnsrPerfPstnYAxis2

y/x	1	2	3	4	5
1	57	64	73	81	90

Supporting Table - P18C8 Gear position sensor range/performance (sensor A min area A)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis1

Notes: KtSPMI_Pct_SnsrPerfPstnX_MinA

y/x	10	18	27	35	44
1	18	19	22	25	30

Supporting Table - P18C8 Gear position sensor range/performance (sensor A max area A)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis1

Notes: KtSPMI_Pct_SnsrPerfPstnX_MaxA

y/x	10	18	27	35	44
1	38	38	38	38	32

Supporting Table - P18C8 Gear position sensor range/performance (sensor A min area B)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis1

Notes: KtSPMI_Pct_SnsrPerfPstnX_MinB

y/x	10	18	27	35	44
1	43	44	46	50	54

Supporting Table - P18C8 Gear position sensor range/performance (sensor A max area B)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis1

Notes: KtSPMI_Pct_SnsrPerfPstnX_MaxB

y/x	10	18	27	35	44
1	63	62	61	60	59

Supporting Table - P18C8 Gear position sensor range/performance (sensor A min area C)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis1

Notes: KtSPMI_Pct_SnsrPerfPstnX_MinC

y/x	10	18	27	35	44
1	70	69	68	68	67

Supporting Table - P18C8 Gear position sensor range/performance (sensor A max area C)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis1

Notes: KtSPMI_Pct_SnsrPerfPstnX_MaxC

y/x	10	18	27	35	44
1	88	88	86	85	82

Supporting Table - P18C8 Gear position sensor range/performance (sensor A min area D)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis2

Notes: KtSPMI_Pct_SnsrPerfPstnX_MinD

y/x	57	64	73	81	90
1	28	23	21	19	18

Supporting Table - P18C8 Gear position sensor range/performance (sensor A max area D)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis2

Notes: KtSPMI_Pct_SnsrPerfPstnX_MaxD

y/x	57	64	73	81	90
1	31	33	35	38	39

Supporting Table - P18C8 Gear position sensor range/performance (sensor A min area E)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis2

Notes: KtSPMI_Pct_SnsrPerfPstnX_MinE

y/x	57	64	73	81	90
1	46	44	44	44	44

Supporting Table - P18C8 Gear position sensor range/performance (sensor A max area E)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis2

Notes: KtSPMI_Pct_SnsrPerfPstnX_MaxE

y/x	57	64	73	81	90
1	53	56	60	63	65

Supporting Table - P18C8 Gear position sensor range/performance (sensor A min area F)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis2

Notes: KtSPMI_Pct_SnsrPerfPstnX_MinF

y/x	57	64	73	81	90
1	68	68	68	69	71

Supporting Table - P18C8 Gear position sensor range/performance (sensor A max area F)

Description: Sensor A threshold values that define the invalid areas (between shifter gates) for the P18C8 diagnostic. Thresholds are a function of Gear Position Sensor B. These values are used with the following calibration to define the invalid areas:

KnSPMI_Pct_SnsrPerfPstnYAxis2

Notes: KtSPMI_Pct_SnsrPerfPstnX_MaxF

y/x	57	64	73	81	90
1	75	80	83	87	88

Supporting Table - P0806 EngTorqueThreshold Table

Description: The diagnostic is inhibited if torque (NM) is less than this value. Prevents false fails in regions where false in-gear N/TOS ratios are possible due to low torque, where high torque would otherwise cause slip and prevent a valid in-gear state.

Notes: DTCs: P0806; Calibration Name: KtMTCI_M_TorqueEnable; Axis label is Percent Clutch Pedal Position (%), where 0% = bottom of pedal travel. Calibration value units are torque (Newton-Meters).

y/x	0.00	6.25	12.50	18.75	25.00	31.25	37.50	43.75	50.00	56.25	62.50	68.75	75.00	81.25	87.50	93.75	100.00
1	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Supporting Table - P0806 ResidualErrEnableLow Table

Description: Represents the lower threshold of a deadband where the diagnostic will be inhibited to prevent false fails due to clutch slip that can falsely indicate a valid in-gear N/TOS ratio. The upper threshold of the deadband is represented by the table "P0806 ResidualErrEnableHigh Table".

Notes: DTCs: P0806; Calibration Name: KaMTCI_Pct_ResidErrCalcEnbLow; Axis identifies Gear, where "0" - "5" is gear 1 - 6, respectively; "6" is reverse and "7" is neutral. Calibration value units are Percent Clutch Pedal Position (%), where 0% = bottom of pedal travel.

y/x	0	1	2	3	4	5	6	7
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Supporting Table - P0806 ResidualErrEnableHigh Table

Description: Represents the upper threshold of a deadband where the diagnostic will be inhibited to prevent false fails due to clutch slip that can falsely indicate a valid in-gear N/TOS ratio. The lower threshold of the deadband is represented by the table "P0806 ResidualErrEnableLow Table".

Notes: DTCs: P0806; Calibration Name: KaMTCI_Pct_ResidErrCalcEnbHigh; Axis identifies Gear, where "0" - "5" is gear 1 - 6, respectively; "6" is reverse and "7" is neutral. Calibration value units are Percent Clutch Pedal Position (%), where 0% = bottom of pedal travel.

y/x	0	1	2	3	4	5	6	7
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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	55.0	45.0	35.0	20.0	10.0	8.0	5.0	5.0	8.0	8.0	8.0	8.0

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	55.0	45.0	35.0	20.0	10.0	8.0	5.0	5.0	8.0	8.0	8.0	8.0

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

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	220.0	220.0	220.0	196.0	120.0	72.0	60.0	60.0	52.0	41.0	35.0	32.0	36.0	40.0	44.0	60.0	60.0

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	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

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

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
1	10

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

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
1	140

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

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

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

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

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

Supporting Table - Closed Loop Enable Clarification - KaFCLP_U_SlphrIntglOfst_Thrsh

Description: Integral Offset voltage thresholds (bank and cell specific cals) 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

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

Supporting Table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary

Description: Maximum Total Energy transferred to Cooling System for Ambient and Start-up ECT conditions (Primary Test)

Notes: Z axis is the cooling system energy failure threshold (kJ), X axis is ECT Temperature at Power up (° C) , (Deluxe version)

y/x	-20	-7	10	30	45	60	85
1	10,076	9,085	7,789	6,264	5,120	3,976	2,070

Supporting Table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate

Description: Maximum Total Energy transferred to Cooling System for Ambient and Start-up ECT conditions (Alternate Test)

Notes: Z axis is the cooling system energy failure threshold (kJ), X axis is ECT Temperature at Power up (° C), (Deluxe version)

y/x	-20	-7	10	30	45	60	85
1	12,727	11,480	9,848	7,929	6,490	5,051	2,652

Supporting Table - P057B KtBRKI_K_FastTestPointWeight

Description:

Notes:

y/x	0.000	0.050	0.080	0.250	0.350	0.450	0.550	0.750	1.000
1	0	1	1	1	1	1	1	1	1

Supporting Table - P057B KtBRKI_K_CmpltTestPointWeight

Description:

Notes:

y/x	0.000	0.050	0.080	0.250	0.350	0.450	0.550	0.750	1.000
1	0	1	1	1	1	1	1	1	1

Supporting Table - P1400_ColdStartDiagnosticDelayBasedOnEngineRunTime

Description: Quality weight-based on engine run time. This allows adjustment of the weighting factors at various engine run times in order to prevent the updating of the cumulative quality timer or to change the value of the average qualified residual energy calculation to prevent false Fails of the diagnostic under circumstances inappropriate to update the calculation of the average qualified residual value.

Notes: KtCSED_K_TimeWght - This is used for P1400.

y/x	0	2	2	4	5	10	15	20	30
1	0	0	1	1	1	1	1	1	1

Supporting Table - P050D_P1400_CatalystLightOffExtendedEngineRunTimeExit

Description: Exit Catalyst Warm-up mode if Engine Run Time is greater than this value. This table is based on percent ethanol (x-axis) and catmon's NormRatio_EWMA value (y-axis). The NormRatio_EWMA value determines the state of the catalyst. Typically, NormRatio_EWMA values below 0.35 (0 is bad and 1 is good) represent catalysts that have degraded. The emission performance of these degraded catalysts can be improved by extending catalyst light off of GetE85R_Pct_FFS_CompAtEngFloat.

Notes: KtCSEC_t_ExtendedEngineExit. Used for both P050D and P1400.

y/x	0	25	50	75	100
0.000	30	30	30	30	30
0.125	30	30	30	30	30
0.250	30	30	30	30	30
0.375	30	30	30	30	30
0.500	30	30	30	30	30
0.625	30	30	30	30	30
0.750	30	30	30	30	30
0.875	30	30	30	30	30
1.000	30	30	30	30	30

Supporting Table - P1400_ColdStartDiagnosticDelayBasedOnEngineRunTimeCalAxis

Description: This is the x-axis for the KtCSED_K_TimeWght calibration table. Refer to the description for KtCSED_K_TimeWght for details.

Notes: KnCSED_t_TimeWght - This is used for P1400.

y/x	1	2	3	4	5	6	7	8	9
1	0	2	2	4	5	10	15	20	30

Supporting Table - P1400_EngineSpeedResidual_Axis

Description: This calibration is used as the x-axis for KtCSED_dm_Exh. An engine speed value will be chosen from this axis based on the value of VeSPDR_n_EngDsrd or actual engine speed. Subsequently, the engine speed value chosen from KnCSED_n_Exh determines the appropriate exhaust airflow value from the KtCSED_dm_Exh calibration table.

Notes: KnCSED_n_Exh - This is used for P1400

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	600	750	800	830	850	900	950	1,000	1,030	1,060	1,080	1,100	1,130	1,135	1,150	1,300	1,500

Supporting Table - P1400_EngineSpeedResidual_Table

Description: This 1x17 table of engine exhaust flow values is used to calculate both the desired and the actual engine exhaust flow based on desired and actual engine speed. The desired engine exhaust flow is gathered from the desired engine speed (VeSPDR_n_EngDsrd). The value used for the actual engine exhaust flow is based on the actual engine RPM value.

Notes: KtCSED_dm_Exh - This is used for P1400

y/x	600	750	800	830	850	900	950	1,000	1,030	1,060	1,080	1,100	1,130	1,135	1,150	1,300	1,500
1	1	1	5	5	5	5	8	8	8	8	8	11	11	12	12	12	12

Supporting Table - P1400_SparkResidual_Axis

Description: Calibratible axis into KtCSED_E_ExhEngyPerUnitMass. This is a table of spark values. Spark value used for desired spark is the desired spark during cat light off. Actual spark value used is the final commanded spark.

Notes: KnCSED_phi_ExhEngyPerUnitMass - Used for P1400

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1	-12	-10	-8	-6	-5	-3	0	10	15

Supporting Table - P1400_SparkResidual_Table

Description: Predicted engine-out energy potential based on either the desired cold start spark advance value or the actual spark advance value. ExhEngyPerUnitMass calibration is used to calculate both desired exhaust energy and actual energy. The desired and actual exhaust energy per unit mass values are used in part to calculate the desired exhaust energy per unit time and actual exhaust energy per unit time. Both desired and actual go into the residual exhaust energy per unit time calculation.

Notes: KtCSED_E_ExhEngyPerUnitMass

y/x	-12	-10	-8	-6	-5	-3	0	10	15
1	1.10	1.10	1.10	1.10	1.05	1.00	0.98	0.75	0.60

Supporting Table - P0011_CamPosErrorLimIc1

Description: P0011 - Cam Position Error Limit for performance diagnostic

Notes: KtPHSD_phi_CamPosErrorLimIc1

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

Supporting Table - P0011_StablePositionTimeIc1

Description: P0011 - Delay after transient move

Notes: KtPHSD_t_StablePositionTimeIc1

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

Supporting Table - P0011_PerfMaxIc1

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	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
2	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
3	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
4	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
6	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
7	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
8	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
9	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
10	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
11	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
12	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
13	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
14	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
15	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
16	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
17	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0

Supporting Table - P0016 P0017 P0018 P0019 Cam Correlation Oil Temperature Threshold

Description: KtEPSI_t_RtnHomeDlyLmt

Notes:

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	300.0	300.0	160.0	18.0	18.0	18.0	18.0	10.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

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	25.55	27.80	26.66	22.79	17.83	16.82	255.00	255.00	255.00

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	18.88	27.23	33.71	36.91	43.82	43.79	255.00	255.00	255.00

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	57.00	93.00	135.00	188.00	236.00	265.00	275.00	275.00

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	69.70	180.36	376.20	511.99	511.99	511.99	511.99	511.99	511.99

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

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

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	3

Supporting Table - P0606_PSW Sequence Sample f(Loop Time)

Description: Sample threshold for PSW per operating loop.

Notes: P0606, KaPISD_Cnt_SequenceSmpl[x]

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

Supporting Table - P1682_PT Relay Pull-in Run/Crank Voltage f(IAT)

Description: The Run/Crank voltages required to pull in the PT relay as a function of induction air temperature.

Notes: P1682, KtEROR_U_PT_RelayPullInEnbl

y/x	23.00	85.00	95.00	105.00	125.00
1.00	7.00	8.70	9.00	9.20	10.00

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_DeltTorqueScrtyAdv

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	22.38	34.31	21.23	22.53	23.28	23.27	23.70	23.31	22.16	19.77	16.69	16.61	16.61	16.61	16.61	16.61
160.00	125.00	20.69	27.05	20.56	21.86	22.64	22.64	23.09	21.97	19.34	17.30	15.59	15.56	15.56	15.56	15.56	15.56
240.00	125.00	19.44	19.45	18.66	21.22	21.69	21.83	22.44	20.88	17.25	15.06	13.70	13.67	13.67	13.67	13.67	13.67
320.00	125.00	15.92	14.69	14.52	16.70	17.97	18.39	19.56	18.47	15.23	12.91	11.11	11.06	11.06	11.06	11.06	11.06
400.00	125.00	12.42	11.81	11.64	13.23	15.08	15.67	16.55	15.56	12.81	10.84	9.31	9.28	9.28	9.28	9.28	9.28
480.00	125.00	10.19	9.89	9.70	10.95	12.95	13.66	14.34	13.42	10.98	9.30	8.03	8.00	8.00	8.00	8.00	8.00
560.00	125.00	8.66	8.50	8.33	9.34	11.36	12.09	12.66	11.80	9.63	8.13	7.02	6.98	6.98	6.98	6.98	6.98
640.00	125.00	7.52	7.45	7.28	8.16	10.13	10.86	11.31	10.53	8.56	7.20	6.20	6.19	6.19	6.19	6.19	6.19
720.00	125.00	6.64	6.63	6.48	7.22	9.13	9.86	10.23	9.50	7.70	6.47	6.00	6.00	6.00	6.00	6.00	6.00
800.00	125.00	6.05	6.08	6.00	6.61	8.44	9.16	9.50	8.81	7.13	6.00	6.00	6.00	6.00	6.00	6.00	6.00
880.00	125.00	6.05	6.08	6.00	6.61	8.44	9.16	9.50	8.81	7.13	6.00	6.00	6.00	6.00	6.00	6.00	6.00
960.00	125.00	6.05	6.08	6.00	6.61	8.44	9.16	9.50	8.81	7.13	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1,040.00	125.00	6.05	6.08	6.00	6.61	8.44	9.16	9.50	8.81	7.13	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1,120.00	125.00	6.05	6.08	6.00	6.61	8.44	9.16	9.50	8.81	7.13	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1,200.00	125.00	6.05	6.08	6.00	6.61	8.44	9.16	9.50	8.81	7.13	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1,280.00	125.00	6.05	6.08	6.00	6.61	8.44	9.16	9.50	8.81	7.13	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1,360.00	125.00	6.05	6.08	6.00	6.61	8.44	9.16	9.50	8.81	7.13	6.00	6.00	6.00	6.00	6.00	6.00	6.00

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	16.82	16.82	16.82	16.82	16.82	16.82

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	-20.00	-10.00	0.00	50.00	90.00
300.00	500.00	500.00	500.00	500.00	500.00	500.00
370.00	500.00	500.00	500.00	500.00	500.00	500.00
435.00	500.00	500.00	500.00	500.00	500.00	500.00
500.00	500.00	500.00	500.00	350.00	200.00	150.00
560.00	500.00	500.00	350.00	200.00	81.83	60.94
660.00	500.00	500.00	200.00	134.34	79.97	58.01
800.00	350.00	350.00	141.23	143.49	83.57	53.00
1,000.00	235.66	176.73	140.24	147.42	97.69	70.25
1,300.00	187.35	140.64	111.53	113.52	71.48	33.72
1,600.00	135.96	92.26	64.60	67.72	30.02	-3.96
2,000.00	64.44	24.98	0.65	2.19	-31.02	-34.66
2,500.00	61.31	22.67	-0.80	-0.68	-34.98	-36.01
3,200.00	55.77	16.62	-7.31	-6.38	-40.01	-43.35
4,000.00	44.94	5.66	-18.44	-17.25	-50.70	-55.10
5,000.00	28.88	-10.39	-34.48	-33.30	-66.77	-71.09
6,100.00	9.48	-29.90	-54.12	-52.74	-86.07	-91.22
6,600.00	-0.11	-39.40	-62.94	-62.33	-95.67	-97.48

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

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	56	54	52	51	49	47	46	44	42	41	39	38	36	34	33	31	29

Supporting Table - P0461, P2066, P2636: Transfer Pump Enable Time Table

Description: Data is TransferPumpOnTimeLimit (in seconds) and Axis is Fuel Level in %

Notes: KtFLVC_t_XferFuelPmpOnTmLim

P0461, P2066, P2636: Transfer Pump Enable Time Table - Part 1

y/x	0	3	6	9	13	16	19	22	25	28	31	34	38	41	44	47	50
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P0461, P2066, P2636: Transfer Pump Enable Time Table - Part 2

y/x	53	56	59	63	66	69	72	75	78	81	84	88	91	94	97	100	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
2	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
3	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
4	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
5	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
6	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
7	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
8	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
9	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
10	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
11	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
12	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
13	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
14	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
15	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
16	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5
17	-311.4	-299.7	-288.0	-276.3	-264.7	-253.0	-241.3	-229.6	-218.0	-206.3	-194.6	-182.9	-171.2	-159.6	-147.9	-136.2	-124.5

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	45	45	45	45	49	57	105	173	340	500	500	500	500	500	500	500	500

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	800	980	1,160	1,340	1,520	1,700	1,880	2,060	2,240	2,420	2,600	2,780	2,960	3,140	3,320	3,500	3,680
120	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
150	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
180	33.00	33.00	33.00	9,999.00	30.00	30.00	30.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
210	33.00	33.00	44.00	87.00	46.00	30.00	30.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
240	47.00	47.00	55.00	87.00	62.00	40.00	37.75	30.00	35.00	35.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
270	64.00	64.00	70.00	115.00	80.00	46.00	35.50	30.00	35.00	35.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
300	80.00	80.00	80.00	150.00	130.00	60.00	45.00	40.00	44.00	44.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
330	95.00	95.00	95.00	160.00	140.00	80.00	70.00	50.00	65.00	71.00	77.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
360	95.00	107.50	120.00	160.00	160.00	110.00	100.00	60.00	67.00	77.00	77.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
390	9,999.00	165.00	165.00	155.00	160.00	165.00	110.00	70.00	75.00	95.00	95.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
420	9,999.00	150.00	150.00	160.00	150.00	130.00	110.00	75.00	80.00	105.00	105.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
450	9,999.00	130.00	130.00	170.00	150.00	130.00	130.00	90.00	85.00	115.00	115.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
480	9,999.00	130.00	130.00	170.00	140.00	160.00	140.00	120.00	120.00	117.00	117.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
510	9,999.00	150.00	150.00	160.00	140.00	160.00	150.00	130.00	132.00	124.50	117.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
540	9,999.00	160.00	160.00	160.00	140.00	146.75	140.00	135.00	132.00	132.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
570	9,999.00	160.00	160.00	160.00	140.00	140.00	140.00	140.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
600	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00

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	800	980	1,160	1,340	1,520	1,700	1,880	2,060	2,240	2,420	2,600	2,780	2,960	3,140	3,320	3,500	3,680
120	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
150	13.00	13.00	13.00	11.50	11.50	10.00	13.50	9.50	10.25	10.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
180	13.00	13.00	13.00	11.50	11.50	10.00	13.50	9.50	10.25	10.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
210	12.25	12.25	22.25	28.50	17.25	10.75	11.50	13.25	11.75	10.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
240	17.75	17.75	32.50	39.50	21.00	19.00	16.75	16.75	16.50	16.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
270	19.00	19.00	40.25	18.50	12.75	21.50	19.50	20.00	16.50	16.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
300	29.00	29.00	48.50	24.25	18.50	27.00	24.00	24.25	19.50	19.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
330	28.50	28.50	75.00	35.50	20.50	28.75	33.00	28.25	21.25	19.75	18.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
360	28.50	39.25	49.75	31.00	32.00	31.25	45.00	28.75	20.00	18.00	18.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
390	9,999.00	52.50	52.50	18.75	13.50	12.50	17.50	23.25	16.75	13.00	13.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
420	9,999.00	24.50	24.50	22.00	14.75	17.75	24.75	23.25	17.25	12.25	12.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
450	9,999.00	25.00	25.00	30.00	18.50	21.00	39.00	24.00	17.50	13.00	13.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
480	9,999.00	30.00	30.00	31.00	21.75	20.50	24.25	21.25	16.50	15.25	15.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
510	9,999.00	35.00	35.00	35.00	21.00	20.75	21.50	22.00	30.50	23.75	23.75	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
540	9,999.00	40.00	40.00	40.00	30.50	25.00	29.50	25.75	30.50	23.75	23.75	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
570	9,999.00	40.00	40.00	40.00	40.00	29.50	29.50	29.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
600	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00

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	800	980	1,160	1,340	1,520	1,700	1,880	2,060	2,240	2,420	2,600	2,780	2,960	3,140	3,320	3,500	3,680
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
150	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
180	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
210	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270	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	0.00	0.00	0.00
300	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	0.00	0.00	0.00
330	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	0.00	0.00	0.00
360	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	0.00	0.00
390	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	0.00	0.00
420	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	0.00	0.00
450	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	0.00	0.00
480	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	0.00	0.00
510	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
540	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
570	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
600	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

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	800	980	1,160	1,340	1,520	1,700	1,880	2,060	2,240	2,420	2,600	2,780	2,960	3,140	3,320	3,500	3,680
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
150	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
180	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270	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	0.00	0.00	0.00
300	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	0.00	0.00	0.00
330	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	0.00	0.00	0.00
360	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	0.00	0.00
390	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	0.00	0.00
420	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	0.00	0.00
450	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	0.00	0.00
480	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	0.00	0.00
510	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	0.00	0.00
540	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
570	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
600	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

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	800	980	1,160	1,340	1,520	1,700	1,880	2,060	2,240	2,420	2,600	2,780	2,960	3,140	3,320	3,500	3,680
120	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
150	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
180	36.00	36.00	36.00	9,999.00	6.25	6.25	6.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
210	36.00	36.00	44.50	25.50	7.50	6.25	6.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
240	53.00	53.00	53.25	25.50	8.75	15.50	21.50	30.00	30.00	30.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
270	76.00	76.00	73.50	29.00	31.25	38.50	27.75	30.00	30.00	30.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
300	95.00	95.00	91.00	34.50	33.50	46.25	34.25	40.00	36.00	36.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
330	110.00	110.00	101.50	57.00	58.25	56.25	36.00	60.00	55.00	63.50	72.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
360	110.00	100.50	91.00	80.50	80.50	63.00	87.50	60.00	58.00	72.00	72.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
390	9,999.00	95.00	95.00	98.00	105.00	73.50	91.50	70.00	65.00	95.00	95.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
420	9,999.00	95.00	95.00	114.00	140.00	112.00	101.00	85.00	80.00	105.00	105.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
450	9,999.00	100.00	100.00	120.00	140.00	120.00	120.00	100.00	85.00	115.00	115.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
480	9,999.00	100.00	100.00	120.00	140.00	140.00	140.00	140.00	130.00	113.00	113.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
510	9,999.00	150.00	150.00	120.00	140.00	140.00	150.00	160.00	140.00	126.50	113.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
540	9,999.00	150.00	150.00	120.00	140.00	140.00	140.00	150.00	140.00	140.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
570	9,999.00	150.00	150.00	120.00	140.00	140.00	140.00	140.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
600	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00

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	800	980	1,160	1,340	1,520	1,700	1,880	2,060	2,240	2,420	2,600	2,780	2,960	3,140	3,320	3,500	3,680
120	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
150	63.50	63.50	63.50	38.75	38.75	29.00	20.00	24.50	18.50	18.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
180	63.50	63.50	63.50	38.75	38.75	29.00	20.00	24.50	18.50	18.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
210	108.50	108.50	84.25	60.50	60.75	46.00	26.00	22.25	20.25	18.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
240	172.50	172.50	60.00	60.00	61.50	37.50	25.50	19.00	31.50	31.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
270	137.50	137.50	42.00	45.75	34.50	19.00	13.00	16.00	31.50	31.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
300	96.50	96.50	38.50	36.25	40.00	23.50	19.00	35.25	47.25	47.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
330	148.50	148.50	33.00	42.25	44.00	39.50	45.25	50.75	67.75	85.50	103.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
360	148.50	104.25	60.00	60.00	66.00	66.00	50.75	81.50	93.75	103.25	103.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
390	9,999.00	60.00	60.00	60.00	84.00	84.00	78.00	101.75	123.25	146.00	146.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
420	9,999.00	70.00	70.00	80.00	78.00	78.00	89.25	105.50	143.75	143.50	143.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
450	9,999.00	80.00	80.00	100.00	78.00	93.50	84.00	114.75	148.75	148.00	148.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
480	9,999.00	90.00	90.00	109.25	121.75	123.75	116.75	123.50	125.25	123.75	123.75	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
510	9,999.00	100.00	100.00	120.00	144.75	143.75	141.00	140.50	124.00	122.50	122.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
540	9,999.00	100.00	100.00	150.00	147.25	147.50	151.50	146.00	124.00	122.50	122.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
570	9,999.00	100.00	100.00	150.00	150.00	151.50	151.50	151.50	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
600	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00

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_PurgOnAirMode5	CeFADR_e_Cell01_PurgOnAirMode4	CeFADR_e_Cell02_PurgOnAirMode3	CeFADR_e_Cell03_PurgOnAirMode2
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_PurgOnAirMode1	CeFADR_e_Cell05_PurgOnAirMode0	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_PurgOffAirMode5	CeFADR_e_Cell09_PurgOffAirMode4	CeFADR_e_Cell10_PurgOffAirMode3	CeFADR_e_Cell11_PurgOffAirMode2
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_PurgOffAirMode1	CeFADR_e_Cell13_PurgOffAirMode0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
1	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell

Supporting Table - P2635 Threshold High

Description: P2635 Threshold - Under performing

Notes: Measured value = instantaneous Filtered Fuel Pressure Error

y/x	200.0	250.0	300.0	350.0	400.0	450.0	500.0	550.0	600.0
0.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
1.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
3.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
4.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
6.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
7.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
9.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
10.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
12.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
13.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
15.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
16.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
18.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
19.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
21.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
22.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
24.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
25.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
27.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
28.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
30.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
31.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
33.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
34.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
36.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
37.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
39.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
40.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
42.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
43.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
45.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
46.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
48.0	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0

Supporting Table - P2635 Threshold Low

Description: P2635 Threshold - Over performing

Notes: Measured value = instantaneous Filtered Fuel Pressure Error

y/x	200.0	250.0	300.0	350.0	400.0	450.0	500.0	550.0	600.0
0.0	-260.0	-210.0	-160.0	-110.0	-60.0	-67.5	-75.0	-82.5	-90.0
1.5	-145.0	-125.0	-102.5	-81.3	-60.0	-67.5	-75.0	-82.5	-90.0
3.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
4.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
6.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
7.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
9.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
10.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
12.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
13.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
15.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
16.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
18.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
19.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
21.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
22.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
24.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
25.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
27.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
28.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
30.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
31.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
33.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
34.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
36.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
37.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
39.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
40.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
42.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
43.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
45.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
46.5	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0
48.0	-30.0	-37.5	-45.0	-52.5	-60.0	-67.5	-75.0	-82.5	-90.0

Supporting Table - P2635 Threshold High RePass

Description: P2635 Threshold Hysterisis - Under performing

Notes: Measured value = instantaneous Filtered Fuel Pressure Error

y/x	200.0	250.0	300.0	350.0	400.0	450.0	500.0	550.0	600.0
0.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
1.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
3.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
4.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
6.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
7.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
9.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
10.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
12.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
13.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
15.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
16.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
18.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
19.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
21.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
22.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
24.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
25.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
27.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
28.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
30.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
31.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
33.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
34.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
36.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
37.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
39.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
40.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
42.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
43.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
45.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
46.5	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5
48.0	25.5	31.9	38.3	44.6	51.0	57.4	63.8	70.1	76.5

Supporting Table - P2635 Threshold Low RePass

Description: P2635 Threshold Hysterisis - Over performing

Notes: Measured value = instantaneous Filtered Fuel Pressure Error

y/x	200.0	250.0	300.0	350.0	400.0	450.0	500.0	550.0	600.0
0.0	-221.0	-178.5	-136.0	-93.5	-51.0	-57.4	-63.8	-70.1	-76.5
1.5	-123.3	-106.3	-87.1	-69.1	-51.0	-57.4	-63.8	-70.1	-76.5
3.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
4.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
6.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
7.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
9.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
10.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
12.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
13.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
15.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
16.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
18.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
19.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
21.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
22.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
24.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
25.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
27.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
28.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
30.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
31.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
33.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
34.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
36.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
37.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
39.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
40.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
42.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
43.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
45.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
46.5	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5
48.0	-25.5	-31.9	-38.3	-44.6	-51.0	-57.4	-63.8	-70.1	-76.5

Supporting Table - P2635 Max Fuel Flow

Description: P2635 Max Fuel Flow allowed -- diagnostic is disabled above this value

Notes:

y/x	200.0000	250.0000	300.0000	350.0000	400.0000	450.0000	500.0000	550.0000	600.0000
4.5000	36.8984	36.8984	36.8984	34.5625	32.0469	29.5703	27.1328	24.7266	22.3594
6.0000	36.8984	36.8984	36.8984	34.5625	32.0469	29.5703	27.1328	24.7266	22.3594
7.5000	36.8984	36.8984	36.8984	34.5625	32.0469	29.5703	27.1328	24.7266	22.3594
9.0000	36.8984	36.8984	36.8984	34.5625	32.0469	29.5703	27.1328	24.7266	22.3594
10.5000	36.8984	36.8984	36.8984	34.5625	32.0469	29.5703	27.1328	24.7266	22.3594
12.0000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	35.0625	32.5938	30.1719
13.5000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
15.0000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
16.5000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
18.0000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
19.5000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
21.0000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
22.5000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
24.0000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
25.5000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
27.0000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984
28.5000	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984	36.8984

Supporting Table - P0420_P0430_CatmonMinEngineRunTimeToEnable

Description: This cal value is a 1x5 array of minimum engine run time values based on powerup coolant temperatures. When the appropriate required minimum engine run time value is chosen based on the coolant temperature at powerup, this value is the minimum time from engine start before stabilized conditions are met. Used in determining if a ValidIdleIsMet condition exists.

Notes: KtCATD_t_EngRunTimeMin - Used for P0420 and P0430. Axis is the coolant and the output is the min engine run time

y/x	40	50	60	70	80
1	30	30	30	30	30

Supporting Table - P0420_P0430_CatmonMinAirflowForWarmCatalystDetermination

Description: This is a 1x3 table with the axis being engine coolant temperature. The implementation of this cal value as a table also included some changes to the way that the WarmedUpEvents counter increments and resets. To summarize, whenever WarmedUpEvents resets to 0 (this could be either at startup, if the closed throttle time exceeds a cal value, or if the predicted exhaust temperature falls below the ExhWarmMin cal value), the appropriate MinAirflowToWrmupCat value is chosen from the table based on engine coolant at the time the WarmedUpEvents counter reset to 0. This cal value is used along with the min exhaust temp to increment the WarmedUpEvents counter.

Notes: KtCATD_dm_MinAirFlowToWrmCat - Used for P0420 and P0430. Axis is the engine coolant and the output is the minimum airflow required to warmup the catalyst.

y/x	0	45	90
1	12	8	4

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 norm ratio calculation of P0420

y/x	6.40	6.92	7.45	7.97	8.49	9.02	9.54	10.07	10.59	11.11	11.64	12.16	12.69	13.21	13.73	14.26	14.78
588.00	1.77	1.65	1.45	1.36	1.26	1.17	1.14	1.11	1.06	1.02	0.95	0.85	0.84	0.81	0.79	0.78	0.76
628.00	1.79	1.68	1.48	1.39	1.29	1.20	1.16	1.13	1.08	1.04	0.98	0.86	0.85	0.82	0.80	0.79	0.78
667.00	1.81	1.71	1.51	1.41	1.32	1.22	1.18	1.15	1.10	1.06	1.00	0.87	0.86	0.84	0.82	0.80	0.79
707.00	1.83	1.74	1.54	1.44	1.34	1.25	1.20	1.17	1.11	1.08	1.01	0.88	0.88	0.85	0.83	0.82	0.80
747.00	1.86	1.76	1.56	1.47	1.36	1.27	1.22	1.19	1.14	1.10	1.03	0.89	0.88	0.86	0.84	0.83	0.81
786.00	1.89	1.79	1.58	1.49	1.39	1.29	1.24	1.21	1.16	1.12	1.05	0.91	0.89	0.87	0.85	0.83	0.82
826.00	1.92	1.81	1.61	1.52	1.41	1.32	1.26	1.22	1.18	1.14	1.07	0.92	0.91	0.88	0.85	0.84	0.83
866.00	1.93	1.84	1.63	1.54	1.43	1.34	1.28	1.24	1.19	1.16	1.08	0.93	0.92	0.89	0.86	0.85	0.83
905.00	1.94	1.85	1.65	1.56	1.44	1.36	1.29	1.25	1.21	1.17	1.08	0.94	0.93	0.90	0.87	0.85	0.84

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 norm ratio calculation of P0420

y/x	6.40	6.92	7.45	7.97	8.49	9.02	9.54	10.07	10.59	11.11	11.64	12.16	12.69	13.21	13.73	14.26	14.78
588.00	1.17	1.11	1.05	0.95	0.88	0.81	0.76	0.71	0.68	0.65	0.62	0.59	0.57	0.55	0.53	0.52	0.50
628.00	1.20	1.14	1.07	0.98	0.90	0.83	0.78	0.73	0.69	0.66	0.63	0.60	0.58	0.56	0.55	0.53	0.52
667.00	1.23	1.16	1.10	1.00	0.92	0.85	0.79	0.75	0.71	0.67	0.64	0.62	0.60	0.58	0.56	0.54	0.53
707.00	1.26	1.19	1.12	1.02	0.94	0.87	0.81	0.76	0.72	0.69	0.66	0.63	0.61	0.59	0.57	0.55	0.54
747.00	1.29	1.21	1.15	1.04	0.96	0.89	0.83	0.78	0.74	0.71	0.67	0.64	0.62	0.60	0.58	0.57	0.55
786.00	1.31	1.23	1.17	1.06	0.98	0.91	0.85	0.80	0.76	0.72	0.69	0.66	0.64	0.62	0.60	0.58	0.56
826.00	1.34	1.26	1.20	1.09	1.00	0.93	0.87	0.82	0.77	0.74	0.70	0.67	0.65	0.63	0.61	0.59	0.58
866.00	1.36	1.28	1.23	1.11	1.02	0.95	0.89	0.83	0.79	0.75	0.72	0.68	0.67	0.64	0.62	0.60	0.59
905.00	1.39	1.30	1.25	1.14	1.04	0.97	0.91	0.85	0.81	0.77	0.74	0.70	0.68	0.66	0.64	0.62	0.60

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 norm ratio calculation of P0430

y/x	6.40	6.92	7.45	7.97	8.49	9.02	9.54	10.07	10.59	11.11	11.64	12.16	12.69	13.21	13.73	14.26	14.78
588.00	1.80	1.75	1.54	1.45	1.36	1.26	1.21	1.14	1.09	1.04	1.00	0.95	0.90	0.83	0.79	0.76	0.73
628.00	1.83	1.78	1.58	1.49	1.39	1.30	1.24	1.17	1.12	1.07	1.04	0.97	0.93	0.86	0.81	0.78	0.74
667.00	1.87	1.82	1.62	1.53	1.42	1.33	1.27	1.20	1.15	1.10	1.05	0.99	0.95	0.87	0.83	0.79	0.75
707.00	1.90	1.85	1.67	1.56	1.46	1.37	1.30	1.23	1.17	1.12	1.08	1.01	0.97	0.89	0.85	0.81	0.77
747.00	1.93	1.88	1.70	1.60	1.49	1.40	1.33	1.26	1.19	1.14	1.10	1.03	0.99	0.91	0.87	0.83	0.78
786.00	1.96	1.91	1.74	1.63	1.52	1.42	1.36	1.29	1.22	1.16	1.12	1.05	1.00	0.93	0.89	0.84	0.80
826.00	1.98	1.94	1.78	1.66	1.55	1.45	1.38	1.31	1.25	1.19	1.14	1.07	1.02	0.95	0.91	0.86	0.81
866.00	2.01	1.96	1.81	1.69	1.59	1.47	1.41	1.33	1.27	1.22	1.17	1.09	1.04	0.97	0.93	0.88	0.84
905.00	2.03	1.97	1.83	1.72	1.62	1.50	1.43	1.36	1.30	1.24	1.19	1.13	1.07	0.99	0.95	0.90	0.87

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_1_OSC_BestFailing - Used for norm ratio calculation of P0430

y/x	6.40	6.92	7.45	7.97	8.49	9.02	9.54	10.07	10.59	11.11	11.64	12.16	12.69	13.21	13.73	14.26	14.78
588.00	1.40	1.29	1.20	1.11	1.04	0.97	0.92	0.85	0.81	0.77	0.74	0.68	0.65	0.59	0.53	0.46	0.42
628.00	1.43	1.33	1.23	1.15	1.08	1.00	0.95	0.87	0.83	0.80	0.77	0.71	0.68	0.62	0.55	0.49	0.44
667.00	1.47	1.37	1.27	1.17	1.11	1.03	0.98	0.90	0.86	0.82	0.79	0.74	0.71	0.65	0.57	0.51	0.47
707.00	1.51	1.41	1.31	1.21	1.14	1.06	1.00	0.93	0.88	0.84	0.81	0.76	0.73	0.67	0.59	0.54	0.48
747.00	1.55	1.45	1.35	1.24	1.17	1.10	1.03	0.95	0.91	0.87	0.83	0.78	0.76	0.70	0.61	0.55	0.50
786.00	1.60	1.50	1.38	1.27	1.21	1.13	1.06	0.98	0.93	0.89	0.86	0.81	0.78	0.72	0.63	0.57	0.52
826.00	1.64	1.55	1.43	1.31	1.24	1.16	1.08	1.01	0.96	0.92	0.88	0.83	0.80	0.75	0.65	0.58	0.53
866.00	1.68	1.59	1.47	1.34	1.27	1.18	1.10	1.04	0.99	0.95	0.91	0.85	0.82	0.77	0.67	0.60	0.54
905.00	1.73	1.64	1.51	1.38	1.30	1.20	1.13	1.07	1.02	0.98	0.94	0.87	0.83	0.79	0.70	0.62	0.55

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 alititude 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	1,400	1,600	1,800	2,000
3	495	450	250	175	110	85	60	48	35	32,767	32,767	32,767	32,767
6	495	450	250	175	110	80	55	45	32	32,767	32,767	32,767	32,767
8	550	500	300	200	135	95	65	45	32	32,767	32,767	32,767	32,767
10	660	600	350	225	145	100	80	50	35	32,767	32,767	32,767	32,767
12	770	700	400	250	150	105	85	60	45	32,767	32,767	32,767	32,767
14	880	800	450	280	190	120	90	65	45	32,767	32,767	32,767	32,767
16	1,045	950	500	325	220	150	100	75	60	32,767	32,767	32,767	32,767
18	1,100	1,000	550	350	240	175	120	85	65	32,767	32,767	32,767	32,767
20	1,320	1,200	600	360	265	200	135	100	70	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
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
28	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
32	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
34	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
36	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

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	1,400	1,600	1,800	2,000
3	468	425	225	165	100	80	55	40	30	32,767	32,767	32,767	32,767
6	468	425	225	165	100	75	50	40	30	32,767	32,767	32,767	32,767
8	550	500	275	190	115	90	60	40	30	32,767	32,767	32,767	32,767
10	660	600	325	215	125	95	75	45	25	32,767	32,767	32,767	32,767
12	770	700	375	240	130	100	80	55	35	32,767	32,767	32,767	32,767
14	880	800	450	270	170	115	85	60	40	32,767	32,767	32,767	32,767
16	1,045	950	500	315	200	145	95	70	55	32,767	32,767	32,767	32,767
18	1,100	1,000	550	340	220	170	120	85	65	32,767	32,767	32,767	32,767
20	1,320	1,200	600	360	265	195	135	100	70	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
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
28	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
32	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
34	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
36	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

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
3	495	450	250	175	110	85	60	48	35	32,767	32,767	32,767	32,767
6	495	450	250	175	110	80	55	45	32	32,767	32,767	32,767	32,767
8	550	500	300	200	135	95	65	45	32	32,767	32,767	32,767	32,767
10	660	600	350	225	145	100	80	50	35	32,767	32,767	32,767	32,767
12	770	700	400	250	150	105	85	60	45	32,767	32,767	32,767	32,767
14	880	800	450	280	190	120	90	65	45	32,767	32,767	32,767	32,767
16	1,045	950	500	325	220	150	100	75	60	32,767	32,767	32,767	32,767
18	1,100	1,000	550	350	240	175	120	85	65	32,767	32,767	32,767	32,767
20	1,320	1,200	600	360	265	200	135	100	70	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
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
78	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

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
3	468	425	225	165	100	80	55	40	30	32,767	32,767	32,767	32,767
6	468	425	225	165	100	75	50	40	30	32,767	32,767	32,767	32,767
8	550	500	275	190	115	90	60	40	30	32,767	32,767	32,767	32,767
10	660	600	325	215	125	95	75	45	25	32,767	32,767	32,767	32,767
12	770	700	375	240	130	100	80	55	35	32,767	32,767	32,767	32,767
14	880	800	450	270	170	115	85	60	40	32,767	32,767	32,767	32,767
16	1,045	950	500	315	200	145	95	70	55	32,767	32,767	32,767	32,767
18	1,100	1,000	550	340	220	170	120	85	65	32,767	32,767	32,767	32,767
20	1,320	1,200	600	360	265	195	135	100	70	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
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
78	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Supporting Table - P0300_IdleCyl_Decel

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	1,400	1,600	1,800	2,000
3	1,210	1,100	675	400	275	200	140	105	70	45	30	18	15
6	1,210	1,100	675	400	275	200	140	100	70	42	28	18	14
8	1,375	1,250	750	480	325	225	145	100	70	45	30	22	15
10	1,540	1,400	825	525	360	240	185	110	70	50	36	26	22
12	1,650	1,500	875	575	375	260	210	130	70	50	45	34	24
14	1,815	1,650	1,039	675	450	320	240	130	70	50	50	40	26
16	2,365	2,150	1,111	750	480	360	270	140	75	60	60	45	32
18	2,618	2,380	1,183	800	500	395	325	140	90	80	70	50	38
20	2,823	2,566	1,255	869	580	426	350	150	90	80	80	58	45
22	3,028	2,753	1,325	929	620	455	400	175	125	100	90	66	50
24	3,234	2,940	1,400	989	659	485	425	320	235	140	100	75	54
26	3,440	3,127	1,472	1,049	697	514	484	340	275	155	105	78	60
28	3,851	3,501	1,616	1,169	773	573	559	405	300	185	130	90	70
30	4,311	3,920	1,774	1,303	857	639	646	482	327	221	161	104	82
32	4,826	4,389	1,948	1,452	951	712	746	575	357	264	199	120	95
34	5,403	4,913	2,138	1,618	1,054	794	861	685	389	315	247	138	111
36	6,048	5,501	2,347	1,803	1,169	885	995	815	425	375	305	160	130

Supporting Table - P0300_IdleCyl_Jerk

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	1,400	1,600	1,800	2,000
3	1,210	1,100	625	350	250	180	130	105	70	45	30	18	15
6	1,210	1,100	625	350	250	180	130	95	70	42	26	18	14
8	1,375	1,250	725	460	300	200	130	95	70	40	29	18	15
10	1,540	1,400	825	500	330	210	175	110	70	50	32	24	20
12	1,650	1,500	825	550	325	240	180	130	70	50	40	28	20
14	1,815	1,650	1,039	650	400	300	220	130	75	50	45	34	22
16	2,365	2,150	1,111	730	450	340	250	140	80	60	55	40	30
18	2,618	2,380	1,183	775	500	395	300	140	90	80	60	44	35
20	2,823	2,566	1,255	869	580	426	330	150	90	80	70	52	41
22	3,028	2,753	1,325	929	620	455	380	175	125	100	80	62	50
24	3,234	2,940	1,400	989	659	485	425	310	230	130	90	72	52
26	3,440	3,127	1,472	1,049	697	514	484	340	250	145	95	75	60
28	3,851	3,501	1,616	1,169	773	573	559	405	285	180	125	90	70
30	4,311	3,920	1,774	1,303	857	639	646	482	325	223	164	108	82
32	4,826	4,389	1,948	1,452	951	712	746	575	370	277	216	130	95
34	5,403	4,913	2,138	1,618	1,054	794	861	685	422	344	285	156	111
36	6,048	5,501	2,347	1,803	1,169	885	995	815	481	427	375	187	130

Supporting Table - P0300_CylModeDecel

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	3,001	3,500	4,000	4,500	5,000	5,500	6,000	7,000
3	1,375	1,250	750	480	325	225	150	110	75	50	33	25	18	16	13	12	9	8	6	5	4	4	4	4	4	4
6	1,375	1,250	750	480	325	225	150	110	75	50	33	25	18	16	13	12	9	8	6	5	3	3	3	3	3	3
8	1,375	1,250	750	480	325	225	150	110	75	50	33	25	18	18	13	12	9	8	6	5	3	3	3	3	3	3
10	1,540	1,400	825	525	360	240	185	130	85	60	36	26	22	18	13	13	9	8	6	5	3	3	3	3	3	3
12	1,650	1,500	875	575	375	260	210	150	110	65	45	34	24	18	13	13	9	8	6	5	3	3	3	3	3	3
14	1,815	1,650	1,039	675	450	320	240	175	130	75	50	40	26	20	14	12	10	8	6	5	3	3	3	3	3	3
16	2,365	2,150	1,111	750	480	360	270	200	160	95	60	45	32	24	17	14	12	10	7	5	3	3	3	3	3	3
18	2,618	2,380	1,183	800	500	395	325	230	180	110	70	50	38	28	21	18	14	11	8	5	3	3	3	3	3	3
20	2,823	2,566	1,255	869	580	426	350	260	195	120	80	58	45	34	24	19	15	13	10	6	3	3	3	3	3	3
22	3,028	2,753	1,325	929	620	455	400	290	205	130	90	66	50	38	30	22	17	14	12	6	3	3	3	3	3	3
24	3,234	2,940	1,400	989	659	485	425	320	235	140	100	75	54	40	32	24	18	16	14	6	3	3	3	3	3	3
26	3,440	3,127	1,472	1,049	697	514	484	340	275	155	105	78	60	46	35	25	20	17	16	8	3	3	3	3	3	3
30	3,851	3,501	1,616	1,169	773	573	559	405	300	185	130	90	70	54	40	31	25	21	18	10	4	4	4	4	4	4
40	4,879	4,435	1,977	1,468	963	800	745	540	400	250	180	130	94	72	55	41	33	30	22	14	5	5	5	4	4	4
60	6,934	6,304	2,698	2,067	1,343	1,200	1,118	811	638	394	272	195	141	109	83	61	50	42	26	18	5	5	5	4	4	4
78	7,700	7,000	3,329	2,590	1,676	1,525	1,444	1,047	825	508	350	252	183	141	107	79	65	54	30	22	6	6	6	5	5	5
97	7,920	7,200	4,050	3,189	2,056	1,900	1,817	1,318	1,038	640	442	317	230	177	135	100	81	68	34	26	8	8	8	7	7	7

Supporting Table - P0300_CylModeJerk

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	3,001	3,500	4,000	4,500	5,000	5,500	6,000	7,000
3	1,210	1,100	625	350	250	180	130	105	70	45	30	18	15	12	10	9	8	6	0	0	0	0	0	0	0	0
6	1,210	1,100	625	350	250	180	130	95	70	42	26	18	14	10	8	9	8	6	0	0	0	0	0	0	0	0
8	1,375	1,250	725	460	300	200	130	95	70	40	29	18	15	12	8	10	8	6	0	0	0	0	0	0	0	0
10	1,540	1,400	825	500	330	210	175	120	75	55	32	24	20	14	8	8	8	6	0	0	0	0	0	0	0	0
12	1,650	1,500	825	550	325	240	180	135	85	60	40	28	20	15	11	10	8	6	0	0	0	0	0	0	0	0
14	1,815	1,650	1,039	650	400	300	220	160	115	70	45	34	22	17	12	10	8	7	0	0	0	0	0	0	0	0
16	2,365	2,150	1,111	730	450	340	250	185	135	90	55	40	30	22	17	11	10	8	0	0	0	0	0	0	0	0
18	2,618	2,380	1,183	775	500	395	300	225	170	100	60	44	35	28	21	15	12	11	0	0	0	0	0	0	0	0
20	2,823	2,566	1,255	869	580	426	330	255	185	110	70	52	41	32	22	17	14	12	0	0	0	0	0	0	0	0
22	3,028	2,753	1,325	929	620	455	380	285	200	120	80	62	50	36	30	20	16	12	0	0	0	0	0	0	0	0
24	3,234	2,940	1,400	989	659	485	425	310	230	130	90	72	52	40	32	22	18	16	0	0	0	0	0	0	0	0
26	3,440	3,127	1,472	1,049	697	514	484	340	250	145	95	75	60	46	35	24	20	17	0	0	0	0	0	0	0	0
30	3,851	3,501	1,616	1,169	773	573	559	405	285	180	125	90	70	54	40	29	22	18	0	0	0	0	0	0	0	0
40	4,879	4,435	1,977	1,468	963	800	745	540	380	250	180	130	94	72	55	41	32	28	0	0	0	0	0	0	0	0
60	6,934	6,304	2,698	2,067	1,343	1,200	1,118	811	574	394	272	195	141	109	83	61	50	42	0	0	0	0	0	0	0	0
78	7,700	7,000	3,329	2,590	1,676	1,525	1,444	1,047	742	508	350	252	183	141	107	79	65	54	0	0	0	0	0	0	0	0
97	7,920	7,200	4,050	3,189	2,056	1,900	1,817	1,318	933	640	442	317	230	177	135	100	81	68	0	0	0	0	0	0	0	0

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	3,001	3,500	4,000	4,500	5,000	5,500	6,000	7,000
3	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	110	70	40	35	25	20	20	20
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	110	70	40	35	25	20	20	20
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	110	70	40	35	25	20	20	20
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	110	70	40	35	25	20	20	20
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	110	80	40	35	25	20	20	20
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	130	90	50	35	25	20	20	20
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	140	100	50	40	25	20	20	20
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	150	100	50	40	25	20	20	20
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	160	120	60	45	25	25	25	25
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	170	130	70	50	30	25	25	25
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	180	140	80	55	35	25	25	25
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	200	150	90	60	45	30	30	30
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	250	170	125	80	55	40	40	40
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	350	230	160	110	80	60	60	60
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	400	300	195	150	100	80	80	80
78	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	450	350	230	180	120	100	100	100
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	500	400	265	210	140	120	120	120

Supporting Table - P0300_Random_SCD_Decel

Description: Mulitplier to SCD_Decel to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_MEDRES_Emiss

y/x	400	500	600	700	800	900	1,000	1,100	1,200
8	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
12	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
16	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
20	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
24	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
30	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
40	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
60	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
98	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15

Supporting Table - P0300_Random_SCD_Jerk

Description: Mulitplier to Random_SCD_Jerk to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_MEDRES_Emiss

y/x	400	500	600	700	800	900	1,000	1,100	1,200
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_RandomCylModDecel

Description: Multiplier to P0300_CylMode_Decel. account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

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

y/x	500	700	900	1,100	1,400	1,800	2,200	2,600	3,000
8	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
12	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
16	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
20	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
24	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
30	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
40	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
60	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
98	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15

Supporting Table - P0300_RandomCylModJerk

Description: Multiplier to P0300_CylMode_Jerk to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_Emiss

y/x	500	700	900	1,100	1,400	1,800	2,200	2,600	3,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_RandomRevModDecl

Description: Mulitplier to P0300_RevMode_Decel to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_RevModeEmiss

y/x	3,001	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_Pair_SCD_Decel

Description: Mulitplier to P0300_SCD_Decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_MEDRES_Opp

y/x	400	500	600	700	800	900	1,000	1,100	1,200
8	0.90	0.90	0.69	0.88	0.90	0.80	0.85	0.89	0.90
12	0.83	0.83	0.88	0.90	0.88	0.82	0.88	0.83	0.89
16	0.80	0.80	0.80	0.90	0.89	0.87	0.90	0.88	0.62
20	0.86	0.86	0.90	0.90	0.90	0.90	0.90	0.90	0.90
24	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
30	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
40	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
60	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
98	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90

Supporting Table - P0300_Pair_SCD_Jerk

Description: Mulitplier to P0300_SCD_Jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_MEDRES_Opp

y/x	400	500	600	700	800	900	1,000	1,100	1,200
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_PairCylModeDecel

Description: Mulitplier to Cyl Mode Deceleration to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_Opp

y/x	500	700	900	1,100	1,400	1,800	2,200	2,600	3,000
8	0.88	0.89	0.84	0.90	0.89	0.90	0.90	0.90	0.90
12	0.90	0.87	0.90	0.90	0.90	0.88	0.89	0.75	0.88
16	0.77	0.90	0.89	0.88	0.84	0.89	0.90	0.79	0.70
20	0.86	0.90	0.90	0.90	0.83	0.83	0.82	0.79	0.77
24	0.83	0.90	0.90	0.86	0.90	0.80	0.85	0.83	0.81
30	0.73	0.86	0.90	0.90	0.90	0.89	0.80	0.81	0.76
40	0.59	0.70	0.78	0.90	0.90	0.85	0.90	0.85	0.80
60	0.50	0.51	0.56	0.65	0.69	0.62	0.69	0.74	0.71
98	0.50	0.50	0.50	0.50	0.50	0.50	0.54	0.65	0.59

Supporting Table - P0300_PairCylModeJerk

Description: Mulitplier to P0300_CylModeJerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_Opp

y/x	500	700	900	1,100	1,400	1,800	2,200	2,600	3,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_Bank_SCD_Decel

Description: Mulitplier to SCD decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_MEDRES_Bank

y/x	400	500	600	700	800	900	1,000	1,100	1,200
12	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
16	0.75	0.69	0.75	0.75	0.75	0.73	0.71	0.75	0.75
18	0.75	0.60	0.70	0.62	0.67	0.67	0.65	0.69	0.54
20	0.75	0.64	0.75	0.75	0.75	0.70	0.71	0.75	0.67
24	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
30	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
40	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
60	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
98	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

Supporting Table - P0300_Bank_SCD_Jerk

Description: Mulitplier to Medres SCD jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_MEDRES_Bank

y/x	400	500	600	700	800	900	1,000	1,100	1,200
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_BankCylModeDecel

Description: Mulitplier to Lores Decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_Bank

y/x	500	700	900	1,100	1,400	1,800	2,200	2,600	3,000
12	0.53	0.61	0.48	0.33	0.31	0.29	0.75	0.50	0.38
16	0.61	0.52	0.47	0.29	0.27	0.25	0.25	0.33	0.38
18	0.42	0.63	0.51	0.43	0.27	0.40	0.36	0.25	0.45
20	0.54	0.54	0.55	0.52	0.31	0.30	0.32	0.36	0.43
24	0.58	0.62	0.49	0.51	0.26	0.26	0.33	0.40	0.47
30	0.60	0.64	0.70	0.43	0.27	0.25	0.28	0.32	0.38
40	0.52	0.58	0.53	0.37	0.32	0.35	0.35	0.39	0.40
60	0.40	0.46	0.38	0.37	0.30	0.28	0.32	0.33	0.38
98	0.39	0.34	0.26	0.32	0.28	0.25	0.31	0.28	0.37

Supporting Table - P0300_BankCylModeJerk

Description: Mulitplier to Lores Jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_Bank

y/x	500	700	900	1,100	1,400	1,800	2,200	2,600	3,000
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	0.94	1.00	0.88	0.94	0.90	0.86
18	1.00	1.00	1.00	0.89	1.00	0.70	1.00	0.70	1.00
20	0.91	1.00	1.00	0.88	0.83	0.81	0.83	1.00	1.00
24	0.80	0.95	0.97	1.03	0.70	0.70	0.76	0.83	0.88
30	0.71	0.86	0.87	0.99	0.70	0.70	0.74	0.70	1.00
40	0.70	0.70	0.70	0.74	0.70	0.70	0.70	0.70	0.71
60	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
98	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70

Supporting Table - P0300_ConsecSCD_Decel

Description: Mulitplier to medres decel to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_MEDRES_Consec

y/x	400	500	600	700	800	900	1,000	1,100	1,200
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_ConsecSCD_Jerk

Description: Mulitplier to medres Jerk to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_MEDRES_Consec

y/x	400	500	600	700	800	900	1,000	1,100	1,200
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.23
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.15	-0.20
24	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
30	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
40	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
60	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
98	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

Supporting Table - P0300_ConsecCylModDecel

Description: Mulitplier to Lores decel to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_Consec

y/x	500	700	900	1,100	1,400	1,800	2,200	2,600	3,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_ConsecCylModeJerk

Description: Mulitplier to Lores Jerk to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_Consec

y/x	500	700	900	1,100	1,400	1,800	2,200	2,600	3,000
8	0	0	0	0	0	0	0	0	0
12	0	0	0	0	-1	0	0	0	-1
16	0	0	0	0	0	0	0	0	-1
20	0	0	0	0	0	0	0	0	-1
24	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0

Supporting Table - P0300_ClyAfterAFM_Decel

Description: Mulitplier to Lores decel to account for different pattern of misfire after a deactivated cylider. Similar to the second cylinder of consecutive cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_PostDeac

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	0.95	1.00	0.89	1.00	1.00	1.00	1.00	1.00
16	0.94	0.74	0.75	1.00	0.78	0.88	1.00	1.00	1.00
20	0.78	0.57	0.51	0.75	0.56	0.50	0.53	1.00	1.00
24	0.76	0.59	0.53	0.60	0.56	0.50	0.50	0.94	0.94
30	0.78	0.54	0.50	0.54	0.57	0.50	0.65	0.95	0.95
40	0.62	0.50	0.50	0.56	0.58	0.50	0.50	0.67	0.67
60	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.60	0.60
98	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.51	0.51

Supporting Table - P0300_CylAfterAFM_Jerk

Description: Mulitplier to Lores Jerkl to account for different pattern of misfire after a deactivated cylider. Similar to the second cylinder of consecutive cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_PostDeac

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0

Supporting Table - P0300_CylBeforeAFM_Decel

Description: Mulitplier to Lores decel to account for different pattern of misfire before a deactivated cylider, but after an active cylinder that follows an deactive cylinder on engine that supports cylinder deactivation in non even fire patterns.. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_PreDeac

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_ClyBeforeAFM_Jerk

Description: Mulitplier to Lores decel to account for different pattern of misfire before a deactivated cylider, but after an active cylinder that follows an deactive cylinder on engine that supports cylinder deactivation in non even fire patterns.. Multipliers are a function of engine rpm and % engine Load.

Notes: KtMSFD_K_ddt_LORES_PreDeac KtMSFD_K_ddt_LORES_PreDeac

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_RandomAFM_Decl

Description: Mulitplier to Cylinder_Decel while in Cylnder Deactivation mode to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_AFM_Emiss

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Supporting Table - P0300_RandomAFM_Jerk

Description: Mulitplier to Cylinder_Jerk while in Cylnder Deactivation mode to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_AFM_Emiss

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	11.3	11.3	11.3	6.3	4.8	4.8	4.8	4.8
10	11.3	11.3	11.3	5.9	4.8	4.8	4.8	4.8
20	11.3	11.3	6.8	5.4	4.8	4.8	4.8	4.8
30	6.8	6.3	5.8	4.8	4.8	4.8	4.8	4.8
40	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
50	4.8	4.8	4.8	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

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	CeTGRR_e_TransGrEVT1
1	5,800	5,800	5,800	5,800	5,700	5,700	5,800

P0300 EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	5,800	4,000	5,800	4,000	5,800	5,800	

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	3,001	3,500	4,000	4,500	5,000	5,500	6,000	7,000
1	-2.50	-2.50	-2.50	-2.50	-2.50	-2.00	-1.50	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	2.00	1.50	0.00	0.00	2.50	5.00	7.50	10.00	12.50	15.00	17.50

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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	3,001	3,500	4,000	4,500	5,000	5,500	6,000	7,000
1	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	0.00	0.00	2.50	5.00	7.50	10.00	12.50	15.00	17.50

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	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00

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

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

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

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	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Supporting Table - P0300_1st_FireAftrMisfr_Acel

Description: Multiplier for establishing the expected acceleration of the cylinder after the misfire

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_CylAftMsfr

y/x	900	1,200	1,600	2,000	3,000
8	0.65	0.65	0.65	0.65	0.65
14	0.63	0.65	0.65	0.65	0.65
20	0.41	0.50	0.65	0.65	0.65
26	0.24	0.45	0.65	0.58	0.59
40	0.10	0.50	0.44	0.48	0.60

Supporting Table - P0300_1st_FireAftrMisfr_Jerk

Description: Multiplier for establishing the expected Jerk of the cylinder after the misfire

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_CylAftMsfr

y/x	900	1,200	1,600	2,000	3,000
8	-0.50	-0.64	-0.72	-0.65	-0.50
14	-0.75	-0.70	-0.56	-0.93	-0.93
20	-1.00	-0.81	-0.57	-0.92	-0.92
26	-1.32	-0.70	-0.53	-0.91	-0.91
40	-1.33	-0.92	-0.67	-0.90	-0.90

Supporting Table - P0300_SnapDecayAfterMisfire

Description: multiplier times the ddt_jerk value used used to detect misfire at that speed and load to see if size of disturbance has died down as expected of real misfire. Table lookup as a function of engine rpm and trans gear ratio.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dddt_PostCylAft

y/x	900	1,100	1,400	1,800	2,200	2,600	3,000	4,000	5,000
0	1.17	1.23	1.50	1.65	1.42	1.97	2.00	2.00	2.00
1	1.17	1.23	1.50	1.65	1.42	1.97	2.00	2.00	2.00
1	1.17	1.23	1.50	1.65	1.42	1.97	2.00	2.00	2.00
1	1.10	1.14	1.54	1.28	1.25	1.15	1.43	1.43	1.43
1	1.97	2.00	2.00	1.44	1.39	1.67	1.67	1.67	1.67
2	1.92	1.41	1.39	1.63	1.54	1.80	1.83	1.83	1.83
4	1.88	1.41	1.57	1.47	1.59	2.00	2.00	2.00	2.00
5	2.00	1.67	1.83	1.47	1.59	2.00	2.00	2.00	2.00
5	2.00	1.67	1.83	1.47	1.59	2.00	2.00	2.00	2.00

Supporting Table - P0300_RepetSnapDecayAdjst

Description: If misfire is present in consecutive engine cycles, this multiplier is applied to the misfire jerk threshold and compared to a crankshaft snap value after the misfire has taken place.. Table lookup as a function of engine rpm.

Notes: Used for P0300 - P0308, Cal Name:KtMSFD_K_dddt_PostCylCnscMsfr

y/x	900	1,100	1,400	1,800	2,200	2,600	3,000	4,000	5,000
1	1.00	1.31	1.17	1.08	1.17	1.00	1.00	1.00	1.00

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	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72

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
200	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
300	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
500	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
700	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
800	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
900	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,000	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,100	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,200	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,300	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1,400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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 NormRatio calculation for P0420

y/x	6.40	6.92	7.45	7.97	8.49	9.02	9.54	10.07	10.59	11.11	11.64	12.16	12.69	13.21	13.73	14.26	14.78
588.00	1.77	1.65	1.45	1.36	1.26	1.17	1.14	1.11	1.06	1.02	0.95	0.85	0.84	0.81	0.79	0.78	0.76
628.00	1.79	1.68	1.48	1.39	1.29	1.20	1.16	1.13	1.08	1.04	0.98	0.86	0.85	0.82	0.80	0.79	0.78
667.00	1.81	1.71	1.51	1.41	1.32	1.22	1.18	1.15	1.10	1.06	1.00	0.87	0.86	0.84	0.82	0.80	0.79
707.00	1.83	1.74	1.54	1.44	1.34	1.25	1.20	1.17	1.11	1.08	1.01	0.88	0.88	0.85	0.83	0.82	0.80
747.00	1.86	1.76	1.56	1.47	1.36	1.27	1.22	1.19	1.14	1.10	1.03	0.89	0.88	0.86	0.84	0.83	0.81
786.00	1.89	1.79	1.58	1.49	1.39	1.29	1.24	1.21	1.16	1.12	1.05	0.91	0.89	0.87	0.85	0.83	0.82
826.00	1.92	1.81	1.61	1.52	1.41	1.32	1.26	1.22	1.18	1.14	1.07	0.92	0.91	0.88	0.85	0.84	0.83
866.00	1.93	1.84	1.63	1.54	1.43	1.34	1.28	1.24	1.19	1.16	1.08	0.93	0.92	0.89	0.86	0.85	0.83
905.00	1.94	1.85	1.65	1.56	1.44	1.36	1.29	1.25	1.21	1.17	1.08	0.94	0.93	0.90	0.87	0.85	0.84

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 norm ratio calculation for P0420

y/x	6.40	6.92	7.45	7.97	8.49	9.02	9.54	10.07	10.59	11.11	11.64	12.16	12.69	13.21	13.73	14.26	14.78
588.00	1.17	1.11	1.05	0.95	0.88	0.81	0.76	0.71	0.68	0.65	0.62	0.59	0.57	0.55	0.53	0.52	0.50
628.00	1.20	1.14	1.07	0.98	0.90	0.83	0.78	0.73	0.69	0.66	0.63	0.60	0.58	0.56	0.55	0.53	0.52
667.00	1.23	1.16	1.10	1.00	0.92	0.85	0.79	0.75	0.71	0.67	0.64	0.62	0.60	0.58	0.56	0.54	0.53
707.00	1.26	1.19	1.12	1.02	0.94	0.87	0.81	0.76	0.72	0.69	0.66	0.63	0.61	0.59	0.57	0.55	0.54
747.00	1.29	1.21	1.15	1.04	0.96	0.89	0.83	0.78	0.74	0.71	0.67	0.64	0.62	0.60	0.58	0.57	0.55
786.00	1.31	1.23	1.17	1.06	0.98	0.91	0.85	0.80	0.76	0.72	0.69	0.66	0.64	0.62	0.60	0.58	0.56
826.00	1.34	1.26	1.20	1.09	1.00	0.93	0.87	0.82	0.77	0.74	0.70	0.67	0.65	0.63	0.61	0.59	0.58
866.00	1.36	1.28	1.23	1.11	1.02	0.95	0.89	0.83	0.79	0.75	0.72	0.68	0.67	0.64	0.62	0.60	0.59
905.00	1.39	1.30	1.25	1.14	1.04	0.97	0.91	0.85	0.81	0.77	0.74	0.70	0.68	0.66	0.64	0.62	0.60

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 Norm Ratio calculation for P0430

y/x	6.40	6.92	7.45	7.97	8.49	9.02	9.54	10.07	10.59	11.11	11.64	12.16	12.69	13.21	13.73	14.26	14.78
588.00	1.80	1.75	1.54	1.45	1.36	1.26	1.21	1.14	1.09	1.04	1.00	0.95	0.90	0.83	0.79	0.76	0.73
628.00	1.83	1.78	1.58	1.49	1.39	1.30	1.24	1.17	1.12	1.07	1.04	0.97	0.93	0.86	0.81	0.78	0.74
667.00	1.87	1.82	1.62	1.53	1.42	1.33	1.27	1.20	1.15	1.10	1.05	0.99	0.95	0.87	0.83	0.79	0.75
707.00	1.90	1.85	1.67	1.56	1.46	1.37	1.30	1.23	1.17	1.12	1.08	1.01	0.97	0.89	0.85	0.81	0.77
747.00	1.93	1.88	1.70	1.60	1.49	1.40	1.33	1.26	1.19	1.14	1.10	1.03	0.99	0.91	0.87	0.83	0.78
786.00	1.96	1.91	1.74	1.63	1.52	1.42	1.36	1.29	1.22	1.16	1.12	1.05	1.00	0.93	0.89	0.84	0.80
826.00	1.98	1.94	1.78	1.66	1.55	1.45	1.38	1.31	1.25	1.19	1.14	1.07	1.02	0.95	0.91	0.86	0.81
866.00	2.01	1.96	1.81	1.69	1.59	1.47	1.41	1.33	1.27	1.22	1.17	1.09	1.04	0.97	0.93	0.88	0.84
905.00	2.03	1.97	1.83	1.72	1.62	1.50	1.43	1.36	1.30	1.24	1.19	1.13	1.07	0.99	0.95	0.90	0.87

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 to calculate norm ratio for P0430

y/x	6.40	6.92	7.45	7.97	8.49	9.02	9.54	10.07	10.59	11.11	11.64	12.16	12.69	13.21	13.73	14.26	14.78
588.00	1.40	1.29	1.20	1.11	1.04	0.97	0.92	0.85	0.81	0.77	0.74	0.68	0.65	0.59	0.53	0.46	0.42
628.00	1.43	1.33	1.23	1.15	1.08	1.00	0.95	0.87	0.83	0.80	0.77	0.71	0.68	0.62	0.55	0.49	0.44
667.00	1.47	1.37	1.27	1.17	1.11	1.03	0.98	0.90	0.86	0.82	0.79	0.74	0.71	0.65	0.57	0.51	0.47
707.00	1.51	1.41	1.31	1.21	1.14	1.06	1.00	0.93	0.88	0.84	0.81	0.76	0.73	0.67	0.59	0.54	0.48
747.00	1.55	1.45	1.35	1.24	1.17	1.10	1.03	0.95	0.91	0.87	0.83	0.78	0.76	0.70	0.61	0.55	0.50
786.00	1.60	1.50	1.38	1.27	1.21	1.13	1.06	0.98	0.93	0.89	0.86	0.81	0.78	0.72	0.63	0.57	0.52
826.00	1.64	1.55	1.43	1.31	1.24	1.16	1.08	1.01	0.96	0.92	0.88	0.83	0.80	0.75	0.65	0.58	0.53
866.00	1.68	1.59	1.47	1.34	1.27	1.18	1.10	1.04	0.99	0.95	0.91	0.85	0.82	0.77	0.67	0.60	0.54
905.00	1.73	1.64	1.51	1.38	1.30	1.20	1.13	1.07	1.02	0.98	0.94	0.87	0.83	0.79	0.70	0.62	0.55

Supporting Table - P00C6 - KtFHPD_p_HPS_PressFallLoThrsh

Description: The minimum acceptable value of fuel rail pressure after High Pressure Start (HPS) is executed. This ensures the pressure does not fall off drastically after High Pressure Start (HPS) is executed, but before engine is in run mode.

Notes: Axes are

y/x	-40	-35	-30	-25	-20	-10	0	8	16	20	24	32	40	60	80	90	112
0	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
13	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
25	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
38	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
50	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
63	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
75	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
88	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
100	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Supporting Table - P00C6 - KtFHPD_Cnt_HPS_PressFallLoThrsh

Description: The maximum acceptable counts of fuel rail pressure below KtFHPD_p_HPS_PressFallLoThrsh after High Pressure Start (HPS) is executed but before engine is in run mode.

Notes:

y/x	-40	-35	-30	-25	-20	-10	0	8	16	20	24	32	40	60	80	90	112
0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
13	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
25	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
38	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
50	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
63	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
75	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
88	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
100	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Supporting Table - P00C6 - KtFHPC_p_HighPressStart

Description: This calibration is the minimum pressure in MPa that will exit High Pressure Start mode and allow fuel delivery

Notes:

y/x	-40	-35	-30	-25	-20	-10	0	8	16	20	24	32	40	60	80	90	112
0	12.0	12.0	10.0	10.0	8.0	4.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	2.0	3.0	3.0	3.0
13	12.0	12.0	10.0	10.0	8.0	4.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	2.0	3.0	3.0	3.0
25	12.0	12.0	12.0	12.0	8.0	4.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
38	13.0	13.0	13.0	13.0	10.0	8.6	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
50	13.0	13.0	13.0	13.0	10.0	8.6	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
63	13.0	13.0	13.0	13.0	10.0	8.6	6.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
75	13.0	13.0	13.0	13.0	10.0	8.6	6.0	5.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
88	13.0	13.0	13.0	13.0	10.0	8.6	7.0	6.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
100	13.0	13.0	13.0	13.0	10.0	8.6	7.5	7.0	6.0	5.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0

Supporting Table - P00C6 - KtFHPC_t_HighPressStartTmout

Description: High Pressure Pump Control Mode will exit (Fuel will be delivered) if this timeout in seconds is reached.

Notes:

y/x	-40	-35	-30	-25	-20	-10	0	8	16	20	24	32	40	60	80	90	112
1	10.0	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Supporting Table - P0089 - P163A - P228C - P228D - P0191 - KtFHPD_t_PumpCntrlEngRunThrsh

Description: The High Pressure Control Performance Diagnostic and Pump Current Diagnostic will not run when the engine run time is below this timer following an engine start.

Notes:

y/x	-30	-20	-10	0	10	20	80	100	110
1	120.0	120.0	80.0	60.0	60.0	60.0	60.0	80.0	120.0

Supporting Table - P0191 - KtFHPD_t_SnsPrfStuckCrankTmout

Description: The maximum crank time allowed before allowing the Sensor Performance Stuck Test to fail

Notes:

y/x	-30	-20	-10	0	10	20	80	100	110
1	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Supporting Table - P0191 - KtFHPD_Cnt_SnsPrfIdlePumpOffDly

Description: The delay counter following the disabling of the high pressure pump used Only for the Sensor Performance Idle Test

Notes:

y/x	0	13	25	38	50	63	75	88	100
65	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0	390.0
70	380.0	380.0	380.0	380.0	380.0	380.0	380.0	380.0	380.0
75	370.0	370.0	370.0	370.0	370.0	370.0	370.0	370.0	370.0
80	360.0	360.0	360.0	360.0	360.0	360.0	360.0	360.0	360.0
85	350.0	350.0	350.0	350.0	350.0	350.0	350.0	350.0	350.0
90	340.0	340.0	340.0	340.0	340.0	340.0	340.0	340.0	340.0
95	330.0	330.0	330.0	330.0	330.0	330.0	330.0	330.0	330.0
100	320.0	320.0	320.0	320.0	320.0	320.0	320.0	320.0	320.0
105	320.0	320.0	320.0	320.0	320.0	320.0	320.0	320.0	320.0

Supporting Table - P0191 - KtFHPD_cmp_DPS_FailLoThrsh (Dual sensors)

Description: Low fail limit of fuel control due to pressure sensor error as Function of desired pressure

Notes:

y/x	0.00	0.40	2.50	3.00	8.00	20.00	24.00	28.00	32.00
1.00	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86

Supporting Table - P0191 - KtFHPD_cmp_DPS_FailHiThrsh (Dual Sensors)

Description: High fail limit of fuel control due to pressure sensor error as Function of desired pressure

Notes:

y/x	0.00	0.40	2.50	3.00	8.00	20.00	24.00	28.00	32.00
1.00	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22

Supporting Table - P0191 - KeFHPD_p_DPSPrsDiffFailThrsh (Dual Sensors)

Description:	
Notes:	
y/x	1.00
1.00	1.00

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	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
2	1	1	1	1	1	1	1	1	1	1	0	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	1	0	0	0	0
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	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	0	0	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
10	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
11	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
12	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
2	1	1	1	1	1	1	1	1	1	1	0	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	1	0	0	0	0
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	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	0	0	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
10	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
11	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
12	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Supporting Table - Multiple DTC Use_Green Sensor Delay Criteria - Airflow

Description: This Calibration is the airflow (in gps) above which the green airflow is acculmulated 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

Supporting Table - Multiple DTC Use_Green Sensor Delay Criteria - Limit

Description: This Calibration is the acculmulated 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

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	0.030	0.045	0.060	0.075	0.090	0.105	0.120	0.135	0.150	0.165	0.180	0.195	0.210	0.225	0.240	1.000

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	0.045	0.060	0.075	0.090	0.105	0.120	0.135	0.150	0.165	0.180	0.195	0.210	0.225	0.240	0.255	1.000

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	0.030	0.045	0.060	0.075	0.090	0.105	0.120	0.135	0.150	0.165	0.180	0.195	0.210	0.225	0.240	1.000

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	0.045	0.060	0.075	0.090	0.105	0.120	0.135	0.150	0.165	0.180	0.195	0.210	0.225	0.240	0.255	1.000

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_PerfCylAbnFiltIntnsity < 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	0.475	0.575	0.472	0.480	0.484	0.436	0.481	0.501	0.459	0.490	0.524	0.571	0.840	0.840	0.840	0.840	0.840

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	7.6992	7.6621	7.6016	7.5156	7.4023	7.2656	7.1035	6.9141	6.7012	6.4629	6.1992	5.9102	5.4102	6.1250	6.9082	7.7598	8.6777

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	19.9355	20.1094	20.1348	20.0098	19.7344	19.3105	18.7344	18.0098	17.1348	16.1094	14.9355	13.6094	13.0879	15.0371	17.1875	19.5371	22.0879

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_OpenFiltIntensity < 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

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_OpenFiltIntensity < 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

Supporting Table - P06B6_P06B7_OpenTestCktThrshMin

Description: Knock Open Circuit Minimum Threshold for Internal Circuit Diagnostic. Used only when the 20 kHz method is being used (see "OpenMethod" description). The Open Test Circuit ensures that the internal circuit used to generate the 20 kHz signal for the Open Circuit diags (P0325, P0330) is within range.

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

Diagnostic fails when the filtered diagnostic output is between the OpenTestCktThrshMin and OpenTestCktThrshMax:
i.e. KtKNKD_k_OpenTestCktMin < VaKNKD_k_OpenTestCktIntFilter < KtKNKD_k_OpenTestCktMax

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	0.252	0.252	0.260	0.270	0.283	0.381	0.590	0.652	1.133	1.098	1.213	1.350	1.350	1.350	1.350	1.350	1.350

Supporting Table - P06B6_P06B7_OpenTestCktThrshMax

Description: Knock Open Circuit Minimum Threshold for Internal Circuit Diagnostic. Used only when the 20 kHz method is being used (see "OpenMethod" description). The Open Test Circuit ensures that the internal circuit used to generate the 20 kHz signal for the Open Circuit diags (P0325, P0330) is within range.

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

Diagnostic fails when the filtered diagnostic output is between the OpenTestCktThrshMin and OpenTestCktThrshMax:
i.e. KtKNKD_k_OpenTestCktMin < VaKNKD_k_OpenTestCktIntFilter < KtKNKD_k_OpenTestCktMax

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	0.455	0.459	0.475	0.490	0.531	0.727	1.125	1.250	2.877	2.814	3.227	3.400	3.400	3.400	3.400	3.400	3.400

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 relavent for a four-cylinder engine and only the first six values in the table are relavent 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

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	4,000	5,000	6,000

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	4,000	5,000	6,000
1	0.00	0.00	0.00	0.45	0.45	0.45	0.46	0.44	0.00

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	-40	40	60	80	90	100	120	130	140

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	-40	40	60	80	90	100	120	130	140
1	0.58	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.00

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

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	0.50	0.30	0.10	0.00	0.00	0.00	0.00

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	0	170	250	275	360	375	400	500	600

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	0	170	250	275	360	375	400	500	600
1	0.00	0.00	0.10	1.00	1.00	1.00	1.00	0.86	0.00

Supporting Table - P06DD_P06DE_MinEnableTorque_OP

Description: Two Stage Oil Pump Rationality Test Torque Min Enable Threshold

Notes: For P06DD and P06DE: KtLUBD_M_OP_InDiagEngTorqMin with X Axis is defined by KnLUBD_n_OP_InDiEngTorqMnRPMAxs

y/x	1,000.0	1,250.0	1,500.0	1,750.0	2,000.0	2,250.0	2,500.0	2,750.0	3,000.0
1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Supporting Table - P06DD_P06DE_MinEnableTorque_OP_Axis

Description: Engine Speed Axis for Two Stage Oil Pump minimum torque enable threshold

Notes: KnLUBD_n_OP_InDiEngTorqMnRPMAxs X Axis for KtLUBD_M_OP_InDiagEngTorqMin

y/x	1	2	3	4	5	6	7	8	9
1	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000

Supporting Table - P06DD_P06DE_MaxEnableTorque_OP

Description: Two Stage Oil Pump Rationality Test Torque Max Enable Threshold

Notes: For P06DD and P06DE: KtLUBD_M_OP_InDiagEngTorqMax with X Axis is defined by KnLUBD_n_OP_InDiEngTorqMxRPMAxs

y/x	1,000.0	1,250.0	1,500.0	1,750.0	2,000.0	2,250.0	2,500.0	2,750.0	3,000.0
1.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0

Supporting Table - P06DD_P06DE_OP_HiStatePressure

Description: Two Stage Oil Pump Oil Pressure in High State

Notes: For P06DD and P06DE: KtLUBD_p_OP_OilPresHighState with X Axis is defined by KnLUBD_n_OP_OilPresRPMAxs and Y Axis is defined by KnLUBD_T_OP_OilPresTempAxs

y/x	-7.0	0.0	20.0	40.0	60.0	80.0	100.0	110.0	120.0
1,000.0	400.0	400.0	400.0	366.0	351.0	326.0	277.0	236.0	218.0
1,500.0	425.0	425.0	425.0	400.0	390.0	374.0	360.0	346.0	310.0
2,000.0	450.0	450.0	450.0	423.0	418.0	403.0	380.0	359.0	337.0
2,500.0	469.0	469.0	469.0	439.0	430.0	410.0	385.0	365.0	341.0
3,000.0	492.0	492.0	492.0	452.0	436.0	426.0	401.0	373.0	351.0
3,500.0	516.0	516.0	516.0	465.0	456.0	437.0	399.0	382.0	356.0
4,000.0	516.0	516.0	516.0	480.0	454.0	437.0	401.0	381.0	356.0
4,500.0	516.0	516.0	516.0	480.0	454.0	437.0	401.0	381.0	356.0
5,000.0	516.0	516.0	516.0	480.0	454.0	437.0	401.0	381.0	356.0

Supporting Table - P06DD_P06DE_OP_PressureRPMAxis

Description: Engine Speed Axis for Two Stage Oil Pump Pressure estimate

Notes: KnLUBD_n_OP_OilPresRPMAxs X Axis for KtLUBD_p_OP_OilPresHighState X Axis

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

Supporting Table - P06DD_P06DE_OP_PressureTempAxis

Description: Oil Temperature Axis for Two Stage Oil Pump Pressure estimate

Notes: KnLUBD_T_OP_OilPresTempAxs Y Axis for KtLUBD_p_OP_OilPresHighState

y/x	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
1.0	-7.0	0.0	20.0	40.0	60.0	80.0	100.0	110.0	120.0

Supporting Table - P06DD_P06DE_MaxEnableTorque_OP_Axis

Description: Engine Speed Axis for Two Stage Oil Pump maximum torque enable threshold

Notes: KnLUBD_n_OP_InDiEngTorqMxRPMAxs X Axis for KtLUBD_M_OP_InDiagEngTorqMax

y/x	1	2	3	4	5	6	7	8	9
1	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000

Supporting Table - P06DD_P06DE_OP_LoStatePressure

Description: Two Stage Oil Pump Oil Pressure in Low State

Notes: For P06DD and P06DE: KtLUBD_p_OP_OilPresLowState with X Axis is defined by KnLUBD_n_OP_OilPresRPMAxs and Y Axis is defined by KnLUBD_T_OP_OilPresTempAxs

y/x	-7	0	20	40	60	80	100	110	120
1,000	273	273	273	260	254	239	225	217	213
1,500	287	287	287	275	271	263	252	243	241
2,000	300	300	300	287	285	275	261	250	248
2,500	313	313	313	298	296	279	265	256	247
3,000	325	325	325	305	300	285	273	263	252
3,500	340	340	340	312	299	293	277	269	260
4,000	340	340	340	320	304	293	281	272	261
4,500	340	340	340	320	304	293	281	272	261
5,000	340	340	340	320	304	293	281	272	261

Supporting Table - P06DD_P06DE_OP_StateChangeMin

Description: Minimum allowed pressure change on a Two Stage Oil Pump state change

Notes: For P06DD and P06DE: KtLUBD_p_OP_StateChangeMin with X Axis is defined by KnLUBD_n_OP_OilPresRPMAxs and Y Axis is defined by KnLUBD_T_OP_OilPresTempAxs

y/x	-7.0	0.0	20.0	40.0	60.0	80.0	100.0	110.0	120.0
1,000.0	64.0	64.0	64.0	53.0	48.0	43.0	26.0	9.0	2.0
1,500.0	69.0	69.0	69.0	62.0	59.0	55.0	54.0	51.0	34.0
2,000.0	75.0	75.0	75.0	68.0	66.0	64.0	59.0	55.0	49.0
2,500.0	78.0	78.0	78.0	70.0	67.0	65.0	60.0	54.0	47.0
3,000.0	83.0	83.0	83.0	73.0	70.0	70.0	64.0	55.0	50.0
3,500.0	88.0	88.0	88.0	77.0	79.0	72.0	61.0	56.0	51.0
4,000.0	88.0	88.0	88.0	80.0	75.0	72.0	60.0	54.0	48.0
4,500.0	88.0	88.0	88.0	80.0	75.0	72.0	60.0	54.0	48.0
5,000.0	88.0	88.0	88.0	80.0	75.0	72.0	60.0	54.0	48.0

Supporting Table - P0521_LowMinOilPresFail

Description: Minimum expected oil presure readings

Notes: For P0521: KtLUBD_p_OP_SnsrMinOilPresFail with X Axis is defined by KnLUBD_n_OP_SnsrMinRPMAxs

y/x	1,000.0	1,500.0	2,000.0	2,500.0	3,000.0	3,500.0	4,000.0	4,500.0	5,000.0
1.0	82.0	110.0	117.0	117.0	121.0	129.0	225.0	225.0	225.0

Supporting Table - P3400_VCEStartUpDelayTime

Description: Engine running enablement based on an engine off time

Notes: For P3400: KtVCEC_t_StartupDelayTime with axis a function of engine mode not running time (VeEMDC_t_EngModeNotRun)

y/x	0	5	10	30	60	100	120	140	160	180	240	300	360	420	600	700	800
1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

Supporting Table - P3400_VCE_EngineRPM_UpperLmt

Description: Engine speed upper limit for AFM

Notes: For P3400: KaVCEC_n_EngineSpeedUpperLimit: with axis defined by gear state. In VCE mode,engine speed greater than this will force an exit. In non-VCE mode, engine speed less than this minus hysteresis enables VCE mode.

P3400_VCE_EngineRPM_UpperLmt - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGrEVT1
1	3,000	3,000	3,000	3,000	3,000	3,000	3,000

P3400_VCE_EngineRPM_UpperLmt - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	3,000	3,000	3,000	3,000	3,000	3,000	

Supporting Table - P3400_VCE_EngineRPM_LowerLmt

Description: Engine speed lower limit for AFM

Notes: For P3400: KaVCEC_n_EngineSpeedLowerLimit with axis defined by gear state. In VCE mode, engine speed less than this will force an exit. In non-VCE mode, engine speed greater than this plus hysteresis enables VCE mode.

P3400_VCE_EngineRPM_LowerLmt - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGrEVT1
1	625	625	625	625	625	625	625

P3400_VCE_EngineRPM_LowerLmt - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	625	625	625	625	625	625	

Supporting Table - P3400_VCE_EngineRPM_PRNDL_UpperLmt

Description: Engine speed upper limit based on PRNDL position

Notes: For P3400: KaVCEC_n_EngineSpeedUprLmtPRNDL This is the lower engine speed limit for VCER based on PRNDL position. See VCE_PRNDL_Axis supporting table for axis definition

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200

Supporting Table - P3400_VCE_EngineRPM_PRNDL_LowerLmt

Description: Engine speed lower limit based on PRNDL position

Notes: For P3400: KaVCEC_n_EngineSpeedLwrLmtPRNDL This is the lower engine speed limit for VCER based on PRNDL position. See VCE_PRNDL_Axis supporting table for axis definition

y/x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Supporting Table - P3400_VCE_PRNDL_Axis

Description: Definition of the PRNDL state in various calibrations axis for VCE mode

Notes: For P3400:

P3400_VCE_PRNDL_Axis - Part 1					
y/x	1	2	3	4	5
1	0	1	2	3	4
2	CeTRGR_e_PRNDL_Drive1	CeTRGR_e_PRNDL_Drive2	CeTRGR_e_PRNDL_Drive3	CeTRGR_e_PRNDL_Drive4	CeTRGR_e_PRNDL_Drive5

P3400_VCE_PRNDL_Axis - Part 2					
y/x	6	7	8	9	10
1	5	6	7	8	9
2	CeTRGR_e_PRNDL_Drive6	CeTRGR_e_PRNDL_Drive7	CeTRGR_e_PRNDL_Drive8	CeTRGR_e_PRNDL_Neutral	CeTRGR_e_PRNDL_Reverse

P3400_VCE_PRNDL_Axis - Part 3					
y/x	11	12	13	14	15
1	10	11	12	13	14
2	CeTRGR_e_PRNDL_Park	CeTRGR_e_PRNDL_Transitional1	CeTRGR_e_PRNDL_Transitional2	CeTRGR_e_PRNDL_Transitional4	CeTRGR_e_PRNDL_Transitional7

P3400_VCE_PRNDL_Axis - Part 4					
y/x	16	17	18	19	20
1	15	16	17	18	19
2	CeTRGR_e_PRNDL_Transitional8	CeTRGR_e_PRNDL_Transitional11	CeTRGR_e_PRNDL_Transitional13	CeTRGR_e_PRNDL_Illegal	

Supporting Table - P3400_VCE_TransGear_Axis

Description: Definition of transmission gear for various calibration axis for VCE mode

Notes: For P3400:

P3400_VCE_TransGear_Axis - Part 1

y/x	1	2	3	4	5	6	7
1	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGrEVT1

P3400_VCE_TransGear_Axis - Part 2

y/x	8	9	10	11	12	13	
1	TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	

Supporting Table - P3400_VCE_VehicleSpeed_PRNDL_Enable

Description: This disables VCE mode in certain PRNDL positions when vehicle speed is equal to or above this cal.

Notes: For P3400: KaVCEC_v_DisabledForPRNDL See VCE_PRNDL_Axis supporting table for axis definition

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	0	0	0	0	318	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Supporting Table - P3400_VCE_PRNDL_NI_Disables

Description: Disables VCE mode in certain PRNDL positions when Neutral Idle Overrides (AFM at Idle) are active.

Notes: For P3400: KaVCEC_b_DisabledForPRNDL_NI

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Supporting Table - P3400_VCE_TransGear_Disables

Description: Disables VCE mode for specific transmission gear state.

Notes: For P3400: KaVCEC_b_DisableForTransGr See VCE_TransGear_Axis supporting table for axis definition

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13
1	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Supporting Table - P3400_VCE_TransGear_DisablesNI

Description: Disables VCE mode for specific transmission gear state when in Neutral Idle

Notes: For P3400: KaVCEC_b_DisableForTransGrNI See VCE_TransGear_Axis supporting table for axis definition

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13
1	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Supporting Table - P3400_VCE_ECOMode_EnableTorqueHyst

Description: Entry threshold for torque based VCE mode selection when eco mode is active. VCE will be enabled for torque if the torque request is less than the max VCE torque minus this calibration in Nm.

Notes: P3400: KaVCEC_M_EcoRedTrqEnterThrsh

P3400_VCE_ECOMode_EnableTorqueHyst - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGrEVT1
1	10	10	10	10	10	10	10

P3400_VCE_ECOMode_EnableTorqueHyst - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	10	10	10	10	10	10	

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Gr1

Description: CeTGRR_e_TransGr1 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Gr1 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Gr1 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Gr2

Description: CeTGRR_e_TransGr2 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Gr2 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Gr2 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Gr1

Description: CeTGRR_e_TransGr1 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Gr1 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	178	178	180	183	186	189	192	195	196	196	197	197	197

P3400_VCE_NormalMode_MaxTorque_Gr1 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	198	198	198	199	199	200	200	201	202	203	204	205	206

Supporting Table - P3400_VCE_NormalMode_EnableTorqueHyst

Description: Entry threshold for torque based VCE mode selection when eco mode is NOT active. VCE will be enabled for torque if the torque request is less than the max VCE torque minus this calibration in Nm.

Notes: For P3400: KaVCEC_M_RedTrqEnterThrsh

P3400_VCE_NormalMode_EnableTorqueHyst - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGrEVT1
1	115	115	15	15	15	15	15

P3400_VCE_NormalMode_EnableTorqueHyst - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	15	15	15	15	15	15	

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Gr2

Description: CeTGRR_e_TransGr2 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Gr2 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	178	178	180	183	186	189	192	195	196	196	197	197	197

P3400_VCE_NormalMode_MaxTorque_Gr2 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	198	198	198	199	199	200	200	201	202	203	204	205	206

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Gr3

Description: CeTGRR_e_TransGr3 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Gr3 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Gr3 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Gr4

Description: CeTGRR_e_TransGr4 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Gr4 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Gr4 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Gr5

Description: CeTGRR_e_TransGr5 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Gr5 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Gr5 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Gr6

Description: CeTGRR_e_TransGr6 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Gr6 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Gr6 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Gr7

Description: CeTGRR_e_TransGr7 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Gr7 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Gr7 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Gr8

Description: CeTGRR_e_TransGr8 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Gr8 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Gr8 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Mode1

Description: CeTGRR_e_TransGrEVT1 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Mode1 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Mode1 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Mode2

Description: CeTGRR_e_TransGrEVT2 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Mode2 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Mode2 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Neutral

Description: CeTGRR_e_TransGrNeut maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Neutral - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Neutral - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Reverse

Description: CeTGRR_e_TransGrRvrs maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Reverse - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Reverse - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_NormalMode_MaxTorque_Park

Description: CeTGRR_e_TransGrPark maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is NOT active. Function of engine speed.

Notes: For P3400: KaVCEC_M_RedTrqMaxIndThrsh

P3400_VCE_NormalMode_MaxTorque_Park - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_NormalMode_MaxTorque_Park - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Gr3

Description: CeTGRR_e_TransGr3 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Gr3 - Part 1													
y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Gr3 - Part 2													
y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Gr4

Description: CeTGRR_e_TransGr4 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Gr4 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Gr4 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Gr5

Description: CeTGRR_e_TransGr5 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Gr5 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Gr5 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Gr6

Description: CeTGRR_e_TransGr6 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Gr6 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Gr6 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Gr7

Description: CeTGRR_e_TransGr7 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Gr7 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Gr7 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Gr8

Description: CeTGRR_e_TransGr8 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Gr8 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Gr8 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Mode1

Description: CeTGRR_e_TransEVT1 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Mode1 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Mode1 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Mode2

Description: CeTGRR_e_TransEVT2 maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Mode2 - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Mode2 - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Neutral

Description: CeTGRR_e_TransNeut maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Neutral - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Neutral - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Reverse

Description: CeTGRR_e_TransRvrs maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Reverse - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Reverse - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Supporting Table - P3400_VCE_ECOMode_MaxTorque_Park

Description: CeTGRR_e_TransPark maximum indicated torque (Nm) allowed in VCE mode when Eco Mode is active. Function of engine speed.

Notes: For P3400: KaVCEC_M_EcoRedTrqMaxIndThrsh

P3400_VCE_ECOMode_MaxTorque_Park - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

P3400_VCE_ECOMode_MaxTorque_Park - Part 2

y/x	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000
1	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192

Fault Bundle Definitions

Bundle Name: 5VoltReferenceA_FA
P0641
Bundle Name: 5VoltReferenceB_FA
P0651
Bundle Name: 5VoltReferenceMAP_OOR_Flt
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

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

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

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: ELCPCircuit_FA
P24BA, P24BB
Bundle Name: EngineMetalOvertempActive
P1258
Bundle Name: EngineMisfireDetected_FA

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, FuelInjedtorCircuit_FA, FuelInjedtorCircuit_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

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

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

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

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.

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

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

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

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

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