16 OBDG05 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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type 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 > (**P0011_CamPosErrorLimIc1**) deg	**Intake Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 Volts = TRUE = FALSE > 0 deg > (**P0011_CamPosErrorLimIc1**) deg AND < (**CalculatedPerfMaxIc1**) deg < 4.50 deg for (**P0011_P05CC_StablePositionTimeIc1**) seconds P0010 P2088 P2089	100.00 failures out of 300.00 samples 100 ms /sample	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Camshaft Actuator Solenoid Circuit Open – Bank 1	P0013	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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Camshaft System Performance – Bank 1	P0014	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	(Exhaust cam Bank 1) Cam Position Error > (**P0014_CamPosErrorLimEc1**) deg	**Exhaust Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 Volts = TRUE = FALSE > 0 deg > (**P0014_CamPosErrorLimEc1**) deg AND < (**CalculatedPerfMaxEc1**) deg < 4.50 deg for (**P0014_P05CE_StablePositionTimeEc1**) seconds P0013 P2090 P2091	100.00 failures out of 300.00 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.
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 Sensor A (end-park phaser)	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 -9.0 crank degrees before or 12.0 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	 CrankSensor_FA 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 **P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold** . One sample per cam rotation	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 B (mid-park phaser)	P0017	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 1 sensor B occurs during the incorrect crank position	2 cam sensor pulses more than -10.0 crank degrees before or 13.0 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	 CrankSensor_FA P0365, P0366 < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. After the first failed test, there is a delay until the camshaft phaser control logic verifies and reports that the camshaft is actually parked. One sample per cam rotation	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 2 Sensor A (end-park phaser)	P0018	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 2 sensor A occurs during the incorrect crank position	2 cam sensor pulses more than -11.0 crank degrees before or 13.0 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	 CrankSensor_FA P0345, P0346 < 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 **P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold** . One sample per cam rotation	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 2 Sensor B (mid-park phaser)	P0019	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 2 sensor B occurs during the incorrect crank position	2 cam sensor pulses more than -9.3 crank degrees before or 11.1 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	 CrankSensor_FA P0390, P0391 < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. After the first failed test, there is a delay until the camshaft phaser control logic verifies and reports that the camshaft is actually parked. One sample per cam rotation	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 Open – Bank 2	P0020	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 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.
Intake Camshaft System Performance – Bank 2	P0021	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 2) Cam Position Error > (**P0021_CamPosErrorLimIc2**) deg	**Intake Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 Volts = TRUE = FALSE > 0 deg > (**P0021_CamPosErrorLimIc2**) deg AND < (**CalculatedPerfMaxIc2**) deg < 4.50 deg for (**P0021_P05CD_StablePositionTimeIc2**) seconds P0020 P2092 P2093	100.00 failures out of 300.00 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.
Exhaust Camshaft Actuator Solenoid Circuit Open – Bank 2	P0023	Detects a VVT system error by monitoring the circuit for electrical integrity	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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Camshaft System Performance – Bank 2	P0024	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	(Exhaust cam Bank 2) Cam Position Error > (**P0024_CamPosErrorLimEc2**) deg	**Exhaust Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 volts = TRUE = FALSE > 0 deg > (**P0024_CamPosErrorLimEc2**) deg AND < (**CalculatedPerfMaxEc2**) deg < 4.50 deg for (**P0024_P05CF_StablePositionTimeEc2**) seconds P0023 P2094 P2095	100.00 failures out of 300.00 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.
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 ohms 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

16 OBDG05 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 ohms 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

16 OBDG05 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 ohms 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

16 OBDG05 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Bypass Valve Control Circuit	P0033	Detect Turbocharger Bypass Valve - Open Circuit	ECM detects that commanded and actual states of output driver do not match because the output is open circuit	Open circuit: ≥ 200 K Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	50 failures out of 63 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P0034 may also set (Turbo/ Super Charger Bypass Valve Control Circuit Low)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Bypass Valve Control Circuit Low	P0034	Detect Turbocharger Bypass Valve - Shorted to Ground	ECM detects that commanded and actual states of output driver do not match because the output is shorted to ground	Short to ground: ≤ 0.5 Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	50 failures out of 63 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P0033 may also set (Turbo/ Super Charger Bypass Valve Control Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Bypass Valve Control Circuit High	P0035	Detect Turbocharger Bypass Valve - Shorted to Power	ECM detects that commanded and actual states of output driver do not match because the output is shorted to power	Short to power: ≤ 0.5 Ω impedence between signal and controller power	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	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.
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 ohms 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 ohms 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

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 ohms 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 ohms 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 ohms 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

16 OBDG05 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 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 ohms 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.
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	7.2 < ohms < 14.5	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P262B IAT_SensorFA < 8.0 ºC > 28,800 seconds -30.0 < ºC < 255.0 < 32.0 volts < 0.08 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.
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	7.2 < ohms < 14.5	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P262B IAT_SensorFA < 8.0 ºC > 28,800 seconds -30.0 < ºC < 255.0 < 32.0 volts < 0.08 seconds	Once per valid cold start	Type B, 2 Trips

16 OBDG05 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 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 ohms 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 ohms 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

16 OBDG05 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 ohms 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.
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	7.2 < ohms < 14.5	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P262B IAT_SensorFA < 8.0 ºC > 28,800 seconds -30.0 < ºC < 255.0 < 32.0 volts < 0.11 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.
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	7.2 < ohms < 14.5	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Engine Run time	ECT_Sensor_FA P262B IAT_SensorFA < 8.0 ºC > 28,800 seconds -30.0 < ºC < 255.0 < 32.0 volts < 0.11 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: **P0068_Delta MAP Threshold f(TPS)** Table, f(TPS). See supporting tables: **P0068_Delta MAF Threshold f(TPS)** Table, f(RPM). See supporting tables: **P0068_Maximum MAF f(RPM)** Table, f(Volts). See supporting tables: **P0068_Maximum MAF f(Volts)**	Engine Speed	> 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.
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	>= 240 ° 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	High Pressure Pump Performance Diagnostic Enable >= 11 Volts > 0.275 MPa >= **P0089 - P163A - P228C - P228D - P0191 - 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 <= 127	Windup High - 750 failures out of 938 samples Windup Low - 750 failures out of 938 Samples 3 samples per engine rotaion	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true andManufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active			

Component/ System	Fault Code	Monitor 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

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

16 OBDG05 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 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 and IAT3 sensor)	P0096	Detects an IAT2 sensor that has stuck in range by comparing to IAT and IAT3 at startup	ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	> 10 deg C <= 15 deg C > 15 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Power Up IAT is between Power Up IAT2 and Power Up IAT3 AND ABS(Power Up IAT2 - Power Up IAT3) AND ABS(Power Up IAT - Power Up IAT2) > ABS(Power Up IAT - Power Up IAT3)	 > 15 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	
			Power Up IAT3 is between Power Up IAT and Power Up IAT2 AND ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT3 -	 > 10 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Power Up IAT2) > ABS(Power Up IAT3 - Power Up IAT)			HumTempSnsrCktFA		

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:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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 deg C 10 consecutive IAT 2 samples	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger Bypass Valve B Control Circuit If two parallel turbos are present.	P00C0	Detect Turbocharger Bypass Valve B - Open Circuit	ECM detects that commanded and actual states of output driver do not match because the output is open circuit	Open circuit: ≥ 200 K Ω impedence between signal and controller ground.	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	50 failures out of 63 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P00C1 may also set (Turbocharger/ Supercharger Bypass Valve B Control Circuit Low)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger Bypass Valve B Control Circuit Low If two parallel turbos are present.	P00C1	Detect Turbocharger Bypass Valve B - Shorted to Ground	ECM detects that commanded and actual states of output driver do not match because the output is shorted to ground	Short to ground: ≤ 0.5 Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	50 failures out of 63 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P00C0 may also set (Turbocharger/ Supercharger Bypass Valve B Control Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger Bypass Valve B Control Circuit High If two parallel turbos are present.	P00C2	Detect Turbocharger Bypass Valve B - Shorted to Power	ECM detects that commanded and actual states of output driver do not match because the output is shorted to power	Short to power: ≤ 0.5 Ω impedence between signal and controller power	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	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.
Turbocharger/ Supercharger Bypass Valve B - Mechanical If two parallel turbos are present.	P00C4	Detect Stuck Closed Bypass Valve B	When measuring time accumulated air mass flow is high pass filtered with filter frequency A failure is detected when Filtered Air Mass Flow	< 0.650 Second, = 7.20 Hz >= 75.00 g/s	Diagnostic Enabled Engine Speed Bypass Valve Commanded Open Duty Cycle for at least Pressure ratio over the compressor Relative Limit Condition keep true for x seconds extra Negative Transient Active: Relative Boost and Pressure derivate Hyst. Negative Transient: Relative Boost or Pressure derivate No Active DTCs:	True >= 1,500 rpm > 6.00 % >= 0.250 s > refer to **P00C4_P2261_KtBSTD_r_SurgeLim** in Supporting Tables 0.80 s >= 15.0 kPa <= -150.0 kPa/s < 5.0 kPa > 50.0 kPa/s BSTR_b_TurboBypassCktFA BSTR_b_BoostSnsrFA MAF_SensorFA	2 Failed tests out of 3 Tests 25ms / sample	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 Rise Test: High Side Fuel Pressure Pressure Fall Test: High Side Fuel Rail Pressure	 < **P00C6 - KtFHPC_p_HighPressStart** (see Supporting Table) <= **P00C6 - KtFHPD_p_HPS_PressFallLoThrsh** (see Supporting Table)	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.	High Pressure Fall Diagnostic during Start Disabled High Pressure Rise Diagnostic during Start Enabled >= 0 KPA < = 0 sec > 8 Volts -20 <= °C <= 127 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	Pressure Rise Test: Time >= **P00C6 - KtFHPC_t_HighPressStartTmout** (see Supporting Table) 6.25 ms per sample Pressure Fall Test: Injected cylinder events >= **P00C6 - KtFHPD_Cnt_HPS_PressFallLoThrsh** (see Supporting Table) 6 samples per engine rotation	Type B, 2 Trips

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Pressure Measurement System - Multiple Sensor Correlation (twin turbo)	P00C7	Detects an inconsistency between pressure sensors in the induction system in which a particular sensor cannot be identified as the failed sensor	See table **P00C7: Twin Turbo Failure Matrix** for the malfunction criteria for this diagnostic. Certain failure combinations in this matrix will set other DTCs if the failures can be correlated to a single sensor. The definition of the column headings is as follows: "MAP & TCBP Diff" = Y if: ABS(Turbocharger Boost Pressure - Manifold Pressure) "MAP & Baro Diff" = Y if: ABS(Baro Pressure - Manifold Pressure) "MAP & Baro2 Diff" = Y if: ABS(Baro Pressure 2 - Manifold Pressure) "TCBP & Baro Diff" = Y if: ABS(Turbocharger Boost Pressure - Baro Pressure) "TCBP & Baro2 Diff" = Y if:	> 10.0 kPa > 10.0 kPa > 10.0 kPa > 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating Manifold Pressure Manifold Pressure Baro Pressure Baro Pressure Baro Pressure 2 Baro Pressure 2 Turbocharger Boost Pressure Turbocharger Boost Pressure No Active DTCs: No Pending DTCs:	> 10.0 seconds >= 50.0 kPa <= 115.0 kPa >= 50.0 kPa <= 115.0 kPa >= 50.0 kPa <= 115.0 kPa >= 50.0 kPa <= 115.0 kPa EngineModeNotRunTimer Error MAP_SensorFA AAP_SnsrFA AAP2_SnsrFA AAP3_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP3_SnsrCktFP	4 failures out of 5 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.
			ABS(Turbocharger Boost Pressure - Baro Pressure 2) "Baro & Baro2 Diff" = Y if: ABS(Baro Pressure - Baro Pressure 2)	> 10.0 kPa > 10.0 kPa				

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 3 Circuit Performance (applications with humidity sensor and IAT3 sensor)	P00E9	Detects an IAT3 sensor that has stuck in range by comparing to IAT and IAT2 at startup	ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	<= 10 deg C > 15 deg C > 15 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Power Up IAT is between Power Up IAT2 and Power Up IAT3 AND ABS(Power Up IAT2 - Power Up IAT3) AND ABS(Power Up IAT - Power Up IAT3) > ABS(Power Up IAT - Power Up IAT2)	 > 15 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	
			Power Up IAT2 is between Power Up IAT and Power Up IAT3 AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 -	 > 15 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Power Up IAT3) > ABS(Power Up IAT2 - Power Up IAT)			HumTempSnsrCktFA		

16 OBDG05 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 3 Low (applications with IAT3 and humidity sensor)	P00EA	Detects a continuous short to ground in the IAT 3 signal circuit or the IAT 3 sensor	Raw IAT 3 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

16 OBDG05 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 3 High (applications with IAT3 and humidity sensor)	P00EB	Detects a continuous open circuit in the IAT 3 signal circuit or the IAT 3 sensor	Raw IAT 3 Input	> 153,665 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 3 Intermittent In-Range	P00EC	Detects a noisy or erratic IAT 3 signal circuit or IAT 3 sensor	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT 3 reading - IAT 3 reading from 100 milliseconds previous)	> 80.00 deg C 10 consecutive IAT 3 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.
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:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Mass Air Flow System Performance (twin turbo)	P0101	Determines if the MAF sensor is stuck within the normal operating range	See table **P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. For P0101: MAF model fails when MAF1 model fails. MAF1 model fails when: ABS(Measured MAF1 Flow – Modeled MAF1 Flow) Filtered MAP1 model fails when ABS(Measured MAP – MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP – MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP – MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP – TIAP Model 1) Filtered TPS model fails when Filtered Throttle Model Error	> 25.0 grams/sec > 25.0 kPa > 25.0 kPa > 25.0 kPa > 30.0 kPa > 350 kPa*(g/s)	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. -	>= 425 RPM <= 6,500 RPM >= -7 Deg C =TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Modeled MAF1 Error multiplied by **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM** and **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on MAF Est** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP1 Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			TIAP Correlation model fails when High Engine Air Flow is TRUE AND Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is TRUE when Mass Air Flow	> 30.0 kPa > 30.0 kPa > 1.5 seconds > 1.5 seconds > a threshold in	No Active DTCs: No Pending DTCs:	**P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP MnfdTempSensorCktFP		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				gm/sec as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow**				
			AND Manifold Pressure	> a threshold in kPa as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**				
			AND Filtered Mass Air Flow - Mass Air Flow	< 2.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm/sec as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP**				
			AND Mass Air Flow - Filtered Mass Air Flow	< 2.0 gm/sec				

16 OBDG05 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	<= 400 Hertz (~ 0.47 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> 0.0 seconds >= 300 RPM >= 10.0 Volts >= 1.0 seconds	300 failures out of 375 samples 1 sample every cylinder firing event	Type B, 2 Trips

16 OBDG05 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 (~ 500.0 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> 0.0 seconds >= 300 RPM >= 10.0 Volts >= 1.0 seconds	300 failures out of 375 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 (twin turbo)	P0106	Determines if the MAP sensor is stuck within the normal operating range	See table **P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when either MAF1 model fails or MAF2 model fails. MAF1 model fails when: ABS(Measured MAF1 Flow – Modeled MAF1 Flow) Filtered MAF2 model failres when: ABS(Measured MAF2 Flow – Modeled MAF2 Flow) Filtered MAP1 model fails when ABS(Measured MAP – MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP – MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP – MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP – TIAP Model 1) Filtered TPS model fails when	 > 25.0 grams/sec > 25.0 grams/sec > 25.0 kPa > 25.0 kPa > 25.0 kPa > 30.0 kPa	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables.	>= 425 RPM <= 6,500 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Modeled MAF1 Error multiplied by **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM** and **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on MAF Est** Modeled MAF2 Error multiplied by **P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on MAF Est** and **P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on RPM**	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.
			Filtered Throttle Model Error TIAP Correlation model fails when High Engine Air Flow is TRUE AND Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time	> 350 kPa*(g/s) > 30.0 kPa > 30.0 kPa > 1.5 seconds > 1.5 seconds	No Active DTCs:	MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP1 Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			High Engine Air Flow is TRUE when Mass Air Flow AND Manifold Pressure AND Filtered Mass Air Flow - Mass Air Flow Low Engine Air Flow is TRUE when Mass Air Flow AND Manifold Pressure -	> a threshold in gm/sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow** > a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP** < 2.0 gm/sec < a threshold in gm/sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow** < a threshold in kPa as a function of engine speed See table	No Pending DTCs:	IAT_SensorFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP MnfdTempSensorCktFP		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			AND Mass Air Flow - Filtered Mass Air Flow	**P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP** < 2.0 gm/sec				
			Manifold Pressure OR Manifold Pressure OR ABS(Manifold Pressure - Turbocharger Boost Pressure) AND ABS(Manifold Pressure - Baro Pressure) AND ABS(Manifold Pressure - Baro Pressure 2) AND ABS(Turbocharger Boost Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure 2) AND ABS(Baro Pressure - Baro Pressure2)	< 50.0 kPa > 115.0 kPa > 10.0 kPa > 10.0 kPa > 10.0 kPa <= 10.0 kPa <= 10.0 kPa <= 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	 > 10.0 seconds EngineModeNotRunTimerError MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP3_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP3_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Manifold Absolute Pressure Sensor Circuit Low (Gen III)	P0107	Detects a continuous short to low in either the signal circuit or the MAP sensor.	MAP Voltage	< 3.3 % of 5 Volt Range (This is equal to 0.17 Volts or 0.0 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.
Manifold Absolute Pressure Sensor Circuit High (Gen III)	P0108	Detects an open sensor ground, continuous short to high, or open in either the signal circuit or the MAP sensor.	MAP Voltage	> 68.0 % of 5 Volt Range (This is equal to 3.40 Volts, or 291.0 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.
Mass or Volume Air Flow B Circuit Range/ Performance	P010B	Determines if the MAF sensor B is stuck within the normal operating range	See table **Turbocharger P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. For P010B: MAF model fails when MAF2 model fails. MAF2 model fails when ABS(Measured MAF2 Flow – Modeled MAF2 Flow) Filtered MAP1 model fails when ABS(Measured MAP – MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP – MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP – MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP – TIAP Model 1) Filtered TPS model fails when Filtered Throttle Model Error	> 25.0 grams/sec > 25.0 kPa > 25.0 kPa > 25.0 kPa > 30.0 kPa > 350 kPa*(g/s)	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. -	>= 425 RPM <= 6,500 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Modeled MAF2 Error multiplied by **P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on MAF Est** and **P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on RPM** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP1 Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by	Continuous Calculation are performed every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			TIAP Correlation model fails when High Engine Air Flow is TRUE AND Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is TRUE when	> 30.0 kPa > 30.0 kPa > 1.5 seconds > 1.5 seconds	No Active DTCs: No Pending DTCs:	**P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP MnfdTempSensorCktFP		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Mass Air Flow	> a threshold in gm/sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow**				
			AND Manifold Pressure	> a threshold in kPa TIAP-MAP as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**				
			AND Filtered Mass Air Flow - Mass Air Flow	< 2.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm/sec as a function of engine speed. See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed. See table				
			-					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP				
			AND Mass Air Flow - Filtered Mass Air Flow	< 2.0 gm/sec				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Mass Air Flow B Sensor Circuit Low Frequency	P010C	Detects a continuous short to low or a open in either the signal circuit or the MAF sensor B	MAF B Output	<= 400 Hertz (~ 0.47 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> 0.0 seconds >= 300 RPM >= 10.0 Volts >= 1.0 seconds	300 failures out of 375 samples 1 sample every cylinder firing event	Type B, 2 Trips

16 OBDG05 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 B Sensor Circuit High Frequency	P010D	Detects a high frequency output from the MAF sensor B	MAF B Output	>= 14,500 Hertz (~ 500.0 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> 0.0 seconds >= 300 RPM >= 10.0 Volts >= 1.0 seconds	300 failures out of 375 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.
Intake Air Temperature Sensor Circuit Performance (applications with humidity sensor and IAT3 sensor)	P0111	Detects an IAT sensor that has stuck in range by comparing to IAT2 and IAT3 at startup	ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	> 10 deg C > 15 deg C <= 15 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Power Up IAT2 is between Power Up IAT and Power Up IAT3 AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT) > ABS(Power Up IAT2 - Power Up IAT3)	 > 15 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	
			Power Up IAT3 is between Power Up IAT and Power Up IAT2 AND ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT3 -	 > 10 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 >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Power Up IAT) > ABS(Power Up IAT3 - Power Up IAT2)			HumTempSnsrCktFA		

16 OBDG05 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

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 deg C 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 occur: 1) ECT at power up > IAT at power up by an IAT based table lookup value after a minimum 28,800 second soak (fast fail). 2) ECT at power up > IAT at power up by 15.0 C after a minimum 28,800 second soak and a block heater has not been detected. 3) ECT at power up > IAT at power up by 15.0 C after a minimum 28,800 seconds soak and the time spent cranking the engine without starting is greater than 10.0 seconds with the LowFuelConditionDiag	See **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:	VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA IgnitionOffTimeValid TimeSinceEngineRunning Valid = Not occurred = False = False ≥ -7 ºC = False ========== > 15.0 ºC < 10.0 seconds ========== > 400 seconds with > 15 MPH 0.50 times the seconds with vehicle speed below 1b	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.
					1d) IAT drops from power up IAT 2a) ECT drops from power up ECT 2b) Engine run time ========== Diagnostic is aborted when 3) or 4) occurs: 3) Engine run time with vehicle speed below 1b 4) Minimum IAT during test	≥ 5.3 ºC ≥ 5 ºC Within ≤ 60 seconds ========== > 1800 seconds ≤ -7 ºC		

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)	< 46 Ohms			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 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.	 10.0 seconds -65.0 Deg C 200.0 Deg C	No Active DTC's	ECT_Sensor_Ckt_FP	3 failures out of 4 samples 1 sec/ sample Continuous	Type B, 2 Trips

16 OBDG05 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 (twin turbo)	P0121	Determines if the Throttle Position Sensor input is stuck within the normal operating range	See table **P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when either MAF1 model fails or MAF2 model fails. MAF1 model fails when ABS(Measured MAF1 Flow – Modeled MAF1 Flow) Filtered MAF2 model fails when ABS(Measured MAF2 Flow – Modeled MAF2 Flow) Filtered MAP1 model fails when ABS(Measured MAP – MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP – MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP – MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP – TIAP Model 1) Filtered	 > 25.0 grams/sec > 25.0 grams/sec > 25.0 kPa > 25.0 kPa > 25.0 kPa > 30.0 kPa	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. - -	>= 425 RPM <= 6,500 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Modeled MAF1 Error multiplied by **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM** and **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on MAF Est** Modeled MAF2 Error multiplied by **P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on MAF Est** and 	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.
			TPS model fails when Filtered Throttle Model Error TIAP Correlation model fails when High Engine Air Flow is TRUE AND Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is	> 350 kPa*(g/s) > 30.0 kPa > 30.0 kPa > 1.5 seconds > 1.5 seconds	No Active DTCs: -	**P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on RPM** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP1 Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			TRUE when Mass Air Flow	> a threshold in gm sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow**		EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault		
			AND Manifold Pressure	> a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**	No Pending DTCs:	EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP MnfdTempSensorCktFP		
			AND Filtered Mass Air Flow - Mass Air Flow	< 2.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed See table				
			-					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			AND Mass Air Flow - Filtered Mass Air Flow	**P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP** < 2.0 gm/sec				

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 64 °C == == == == Range #2 (Alternate) ECT reaches Commanded temperature minus 31 °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	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 EngineTorqueEstInaccurate ≥ 1,800 seconds 120 ≤ Eng Run Tme ≤ 1,450 seconds Ethanol ≤ 87 % ≥ 1.49 miles ********** 9,999 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.
			55 °C ********** Type cal above = 0 (non - heated t-stat) == == == == Range #1 (Primary) ECT reaches 71 °C when Ambient min is ≤ 52 °C and > 10 °C. == == == == Range #2 (Alternate) ECT reaches 55 °C when Ambient min is ≤ 10 °C and > -7 °C. **********	system during the warm-up process. The five energy terms are: heat from combustion (with AFM correction), heat from after-run, heat loss to enviroment, heat loss to cabin and heat loss to DFCO.	The diagnostic test for this key cycle will abort ********** ECT at start run	********** -60 ≤ ECT ≤ 66 °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	< 40.0 mVolts	No Active DTC's	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	320 failures out of 400 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips
					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	= Not active = Not active = Not active = Not active 10.0 < Volts = Not active = Not active = Not active = Not active = False 0.9912 < ratio < 1.0400 50 < mgram < 500 = Closed Loop = TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		
					All Fuel Injectors for active Cylinders Fuel Condition Fuel State	Enabled (On) Ethanol <= 87 % DFCO not active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All of the above met for	> 5.0 seconds		

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 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_ThrottleAuthorityDefaulted MAF_SensorFA MAP_SensorFA EvapExcessPurgePsbl_FA FuelInjectorCircuit_FA Ethanol Composition Sensor FA AIR System FA 10.0 < Volts = All Cylinders active = Complete > 5.0 seconds > 30.0 seconds = False > 150.0 seconds when engine soak time > 28,800 seconds > 150.0 seconds when engine soak time <= 28,800 seconds 0.9912 <=ratio<= 1.0400 > 3.0 seconds	70 failures out of 88 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 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 < 1.2	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: 2 tests per trip 10 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	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	320 failures out of 400 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips
					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	= Not active = Not active = Not active = Not active 10.0 < Volts = Not active = Not active = Not active = Not active = False 0.9912 <=ratio<= 1.0400 50 <=mgrams<= 500 = Closed Loop = TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		
					All Fuel Injectors for active Cylinders Fuel Condition Fuel State	Enabled (On) Ethanol <= 87 % DFCO not active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All of the above met for	> 5.0 seconds		

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 System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Low Fuel Condition Diag Initial delay after Open Test Criteria met (cold start condition) Initial delay after Open Test Criteria met (not cold start condition) Equivalence Ratio Fuel Control State All of the above met for	TPS_ThrottleAuthorityDefaulted MAF_SensorFA MAP_SensorFA EvapExcessPurgePsbl_FA FuelInjectorCircuit_FA Ethanol Composition Sensor FA AIR System FA 10.0 < Volts = All Cylinders active = Complete > 5.0 seconds > 30.0 seconds = False > 150.0 seconds when engine soak time > 28,800 seconds > 150.0 seconds when engine soak time <= 28,800 seconds 0.9912 <= ratio <= 1.0400 not = Power Enrichment > 3.0 seconds	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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. The EWMA caluclation uses a 0.28 coefficient. OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.0 units > 20.0 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor 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	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.
					Post fuel cell Crankshaft Torque DTC's Passed ========== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	= Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info. < 100.0 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 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. The EWMA caluclation uses a 0.28 coefficient. OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.0 units > 75 grams (lower voltage threshold is 350 mvolts and upper voltage threshold is 600 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor 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.	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.
					Condition	= Not Valid, System is not valid until accumulated airflow is greater than 720,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C and **Multiple DTC Use_Green Sensor Delay Criteria - Airflow** (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, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info.		
					DTC's Passed	P2270 P013E P013A P2271 P013F		
					========== After above conditions are met: Fuel Enrich mode continued. ========== During this test the following must stay TRUE or the test will abort: 0.96 <= Fuel EQR <= 1.08	==========		

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.The EWMA caluclation uses a 0.28 coefficient. OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.0 units > 20.0 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor 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.	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.
					Low Fuel Condition Diag Post fuel cell Crankshaft Torque DTC's Passed ========== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	= False = Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info. < 100.0 Nm P2272 P014A ==========		

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. The EWMA caluclation uses a 0.28 coefficient. OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds)	> 8.0 units > 75 grams (lower voltage threshold is 350 mvolts and upper voltage threshold is 600 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor 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.	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.
					Condition	= Not Valid, System is not valid until accumulated airflow is greater than 720,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C and **Multiple DTC Use_Green Sensor Delay Criteria - Airflow** . (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, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info.		
					DTC's Passed	P2272 P014A P013C P2273 P014B		
					========== After above conditions are met: Fuel Enrich mode continued. ========== During this test the following must stay TRUE or the test will abort: 0.96 <= Fuel EQR <= 1.08	==========		

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 > 40 grams > 2 secs > 3 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor 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.	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.
					Low Fuel Condition Diag Post fuel cell Crankshaft Torque DTC's Passed Number of fueled cylinders ========== After above conditions are met: DFCO mode entered (wo driver initiated pedal input).	= False = Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info. < 100.0 Nm P2270 <= 5 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 > 150 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor 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.	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.
					Condition	= Not Valid, System is not valid until accumulated airflow is greater than 720,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C and **Multiple DTC Use_Green Sensor Delay Criteria - Airflow** (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, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info.		
					DTC's Passed	P2270 P013E P013A P2271		
					Number of fueled cylinders ========== After above conditions are met: Fuel Enrich mode entered. ========== During this test the following must stay TRUE or the test will abort: 0.96 <= Fuel EQR <= 1.08	>= 1 cylinders ==========		

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 > 1.2	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: 2 tests per trip 10 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 > 40 grams > 2 secs > 3 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor 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.	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.
					Low Fuel Condition Diag Post fuel cell Crankshaft Torque DTC's Passed Number of fueled cylinders ========== After above conditions are met: DFCO mode entered (wo driver initiated pedal input).	= False = Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info. < 100.0 Nm P2272 <= 5 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 > 150 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor 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.	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.
					Condition	= Not Valid, System is not valid until accumulated airflow is greater than 720,000 grams. Airflow accumulation is only enabled when estimated Cat temperature is above 600 Deg C and **Multiple DTC Use_Green Sensor Delay Criteria - Airflow** (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, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info.		
					DTC's Passed	P2272 P014A P013C P2273		
					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: 0.96 <= Fuel EQR <= 1.08	>= 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	< 40 mvolts	No Active DTC's	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	320 failures out of 400 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips
					AIR intrusive test	= Not active		
					Fuel intrusive test	= Not active		
					Idle intrusive test	= Not active		
					EGR intrusive test	= Not active		
					System Voltage	10.0 < Volts		
					EGR Device Control	= Not active		
					Idle Device Control	= Not active		
					Fuel Device Control	= Not active		
					AIR Device Control	= Not active		
					Low Fuel Condition Diag	= False		
					Equivalence Ratio	0.9912 <= equiv. ratio <= 1.0400		
					Air Per Cylinder	50 <= APC <= 500 mgrams		
					Fuel Control State	= Closed Loop		
					Closed Loop Active	= TRUE (Please see "**Closed Loop Enable Clarification**" in Supporting Tables).		
					All Fuel Injectors for active Cylinders	Enabled (On)		
					Fuel Condition	<= 87 % Ethanol		

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	DFCO not active > 5.0 seconds		

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 EvapExcessPurgePsbl_FA FuelInjectorCircuit_FA Ethanol Composition Sensor FA AIR System FA	70 failures out of 88 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		
					Initial delay after Open Test Criteria met (cold start condition)	> 210.0 seconds when engine soak time > 28,800 seconds		
					Initial delay after Open Test Criteria met (not cold start condition)	> 210.0 seconds when engine soak time <= 28,800 seconds		
					Equivalence Ratio	0.9912 <= ratio <= 1.0400		
					Fuel Control State	not = Power Enrichment		
					All of the above met for	> 3 seconds		

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 > 1.2	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: 2 tests per trip 10 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	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	320 failures out of 400 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips
					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	= Not active = Not active = Not active = Not active 10.0 < Volts = Not active = Not active = Not active = Not active = False 0.9912 <= ratio <= 1.0400 50 <= mgrams <= 500 = Closed Loop = TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		
					All Fuel Injectors for active Cylinders Fuel Condition Fuel State	Enabled (On) <= 87 % Ethanol DFCO not active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All of the above met for	> 5.0 seconds		

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 EvapExcessPurgePsbl_FA FuelInjectorCircuit_FA Ethanol Composition Sensor 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		
					Initial delay after Open Test Criteria met (cold start condition)	> 210.0 seconds when engine soak time > 28,800 seconds		
					Initial delay after Open Test Criteria met (not cold start condition)	> 210.0 seconds when engine soak time <= 28,800 seconds		
					Equivalence Ratio	0.9912 <= ratio <= 1.0400		
					Fuel Control State	not = Power Enrichment		
					All of the above met for	> 3 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) (For use w/o WRAF	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. The EWMA caluclation uses a 0.25 coefficient. OR [The Accumulated time monitored during the R2L Delayed Response Test (Gross failure). AND Pre O2 sensor voltage is	> 0.8 EWMA (sec) >= 2.0 Seconds > 450 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, P013A, P013B, P013E, P013F, P2270, P2271 > 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**	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.
						and **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations: B1S1, B2S1 (if applicable) in Supporting Tables tab.		
					O2 Heater (pre sensor) on for Learned Htr resistance	>= 30 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					(Engine Coolant Or OBD Coolant Enable Criteria IAT Engine run Accum	> 55 ºC = TRUE) > -40 ºC > 30 seconds		
					Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled)	1,150 <= RPM <= 2,650 1,100 <= RPM <= 2,750		
					Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled)	3 <= gps <= 16 42.3 <= MPH <= 80.2 38.5 <= MPH <= 82.0		
					Closed loop integral Closed Loop Active	0.87 <= C/L Int <= 1.07 = TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Evap Ethanol Baro Post fuel cell 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 3.0 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).	not in control of purge not in estimate mode > 70 kpa = enabled = not active = not active >= 60.0 sec 500 <= ºC <= 880 = DFCO possible ========== ========== >= 680 mvolts = DFCO active <= 5 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) (For use w/o WRAF	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. The EWMA caluclation uses a 0.25 coefficient. 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	> 0.8 EWMA (sec) >= 2.0 Seconds < 450 mvolts < 680 mvolts	No Active DTC's P015A test is complete and 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, P013A, P013B, P013E, P013F, P015A, P2270, P2271 = Passed > 10.0 Volts = Not active = Not active = Not active = Not active = False = Not Valid, See definition of	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.
						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) in Supporting Tables tab.		
					O2 Heater (pre sensor) on for Learned Htr resistance	>= 30 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					(Engine Coolant Or OBD Coolant Enable Criteria IAT Engine run Accum	> 55 ºC = TRUE) > -40 ºC > 30 seconds		
					Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled)	1,150 <= RPM <= 2,650 1,100 <= RPM <= 2,750		
					Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled)	3 <= gps <= 16 42.3 <= MPH <= 80.2 38.5 <= MPH <= 82.0		
					Closed loop integral Closed Loop Active	0.87 <= C/L Int <= 1.07 = TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Evap Ethanol Baro Post fuel cell EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp 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 :	(Please see "**Closed Loop Enable Clarification**" in Supporting Tables). not in control of purge not in estimate mode > 70 kpa = enabled = not active = not active >= 60.0 sec 500 <= ºC <= 880 = DFCO inhibit >= 1 cylinders ========== ========== 0 <= gps <= 11 <= 0.8 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) (For use w/o WRAF	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. The EWMA caluclation uses a 0.25 coefficient. OR [The Accumulated time monitored during the R2L Delayed Response Test (Gross failure). AND Pre O2 sensor voltage is above]	> 0.8 EWMA (sec) >= 2.0 Seconds > 450 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 P0151, P0152, P013C, P013D, P014A, P014B, P2272, P2273 > 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**	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.
						and **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations: B1S1, B2S1 in Supporting Tables tab.		
					O2 Heater (pre sensor) on for Learned Htr resistance	>= 30 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					(Engine Coolant Or OBD Coolant Enable Criteria IAT Engine run Accum	> 55 ºC = TRUE) > -40 ºC > 30 seconds		
					Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled)	1,150 <= RPM <= 2,650 1,100 <= RPM <= 2,750		
					Engine Airflow	3 <= gps <= 16		
					Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled)	42.3 <= MPH <= 80.2 38.5 <= MPH <= 82.0		
					Closed loop integral Closed Loop Active	0.87 <= C/L Int <= 1.07 = TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Evap Ethanol Baro Post fuel cell 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 3.0 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).	not in control of purge not in estimate mode > 70 kpa = enabled = not active = not active >= 60.0 sec 500 <= ºC <= 880 = DFCO possible ========== ========== >= 680 mvolts = DFCO active <= 5 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) (For use w/o WRAF	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. The EWMA caluclation uses a 0.25 coefficient. 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	> 0.8 EWMA (sec) > = 2.0 Seconds < 450 mvolts < 680 mvolts	No Active DTC's P015C test is complete and 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 P0151, P0152, P013C, P013D, P014A, P014B, P015C, P2272, P2273 = Passed > 10.0 Volts = Not active = Not active = Not active = Not active = False = Not Valid, See definition of	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.
						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 Tables tab.		
					O2 Heater (pre sensor) on for Learned Htr resistance	>= 30 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					(Engine Coolant Or OBD Coolant Enable Criteria IAT Engine run Accum	> 55 ºC = TRUE) > -40 ºC > 30 seconds		
					Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled)	1,150 <= RPM <= 2,650 1,100 <= RPM <= 2,750		
					Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled)	3 <= gps <= 16 42.3 <= MPH <= 80.2 38.5 <= MPH <= 82.0		
					Closed loop integral Closed Loop Active	0.87 <= C/L Int <= 1.07 = TRUE (Please see “**Closed**		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						Loop Enable Clarification" in Supporting Tables). not in control of purge not in estimate mode > 70 kpa = enabled = not active = not active >= 60.0 sec 500 <= ºC <= 880 = DFCO inhibit >= 1 cylinders ========== ========== 0 <= gps <= 11 <= 0.8 gps		
					Evap Ethanol Baro Post fuel cell EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp 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 :			

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 > 1.2	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: 2 tests per trip 10 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)	>= 1.380 >= 0.100	Engine speed BARO Coolant Temp Coolant Temp MAP Inlet Air Temp MAF Fuel Level Long Term Fuel Trim data accumulation: Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control and/or diagnosis Closed Loop Long Term FT	400 <rpm< 6,600 > 70 kPa > -20 °C (or OBD Coolant Enable Criteria = TRUE) < 150 °C 5 <kPa< 255 -20 <°C< 150 0.5 <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 20.0 seconds of data in the current fuel trim cell before a pass or fail decision can be made. (Please see **P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage** in Supporting Tables for a list of cells utilized for diagnosis) Enabled Enabled (Please see "**Closed Loop Enable Clarification**" and "**Long Term FT Enable Criteria**" in Supporting Tables.)	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.
					EGR Diag. Catalyst Diag. Post O2 Diag. Device Control EVAP Diag. No active DTC:	Intrusive Test Not Active Intrusive Test Not Active Intrusive Test Not Active Not Active “tank pull down” Not Active IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR System FA EvapExcessPurgePsbl_FA Ethanol Composition Sensor FA FuelInjectorCircuit_FA EngineMisfireDetected_FA EGRValvePerformance_FA EGRValveCircuit_FA MAP_EngineVacuumStatus AmbPresDfltdStatuss TC_BoostPresSnsrFA O2S_Bank_1_Sensor_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 45 seconds and are separated by the lesser of 12.0 seconds of purge-on time or enough time to	<= 0.740 <= 1.996 <= 0.750 <= 0.740 <= 1.996		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 11 grams of vapor. A maximum of 5 completed segments or 30 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 200.0 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)	>= 1.380 >= 0.100	Engine speed BARO Coolant Temp Coolant Temp MAP Inlet Air Temp MAF Fuel Level Long Term Fuel Trim data accumulation: Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control and/or diagnosis Closed Loop Long Term FT	400 <rpm< 6,600 > 70 kPa > -20 °C (or OBD Coolant Enable Criteria = TRUE) < 150 °C 5 <kPa< 255 -20 <°C< 150 0.5 <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 20.0 seconds of data in the current fuel trim cell before a pass or fail decision can be made. (Please see **P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage** in Supporting Tables for a list of cells utilized for diagnosis) Enabled Enabled (Please see "**Closed Loop Enable Clarification**" and "**Long Term FT Enable Criteria**" in Supporting Tables.)	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.
					EGR Diag. Catalyst Diag. Post O2 Diag. Device Control EVAP Diag. No active DTC:	Intrusive Test Not Active Intrusive Test Not Active Intrusive Test Not Active Not Active “tank pull down” Not Active IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR System FA EvapExcessPurgePsbl_FA Ethanol Composition Sensor FA FuelInjectorCircuit_FA EngineMisfireDetected_FA EGRValvePerformance_FA EGRValveCircuit_FA MAP_EngineVacuumStatus AmbPresDfltdStatuss TC_BoostPresSnsrFA O2S_Bank_2_Sensor_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 45 seconds and are separated by the lesser of 12.0 seconds of purge-on time or enough time to	<= 0.740 <= 1.996 <= 0.750 <= 0.740 <= 1.996		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 11 grams of vapor. A maximum of 5 completed segments or 30 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 200.0 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.
SENT Fuel Rail Temperature Sensor 1 Circuit Low Fault	P0182	This DTC diagnose SENT fuel rail temperature sensor 1 out of range low	Fuel Temperature Sensor 1 SENT digital read value	< 106.00	No Fault Active on No Fault Pending on	Fuel Temperature Sensor Out of Range Diagnostic Enabled Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (P16E4, P16E5) SENT Intenal Error Fault Active (P126E) Fuel Temperature Sensor SENT Message Error Fault Active (P128C) SENT Intenal Error Fault Pending (P126E) Fuel Temperature Sensor SENT Message Error Fault Pending (P128C)	40.00 failures out of 50.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Temperature Sensor 1 Circuit High Fault	P0183	This DTC diagnose SENT fuel rail temperature sensor 1 out of range high	Fuel Temperature Sensor 1 SENT digital read value	> 1,944.00	No Fault Active on No Fault Pending	Fuel Temperature Sensor Out of Range Diagnostic Enabled Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (P16E4, P16E5) SENT Intenal Error Fault Active (P126E) Fuel Temperature Sensor SENT Message Error Fault Active (P128C) SENT Intenal Error Fault Pending (P126E) Fuel Temperature Sensor SENT Message Error Fault Pending (P128C)	40.00 failures out of 50.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Temperature Sensor 2 Circuit Low Fault	P0187	This DTC diagnose SENT fuel rail temperature sensor 2 out of range low	Fuel Temperature Sensor 1 SENT digital read value	< 106.00	No Fault Active on No Fault Pending	Fuel Temperature Sensor Out of Range Diagnostic Enabled Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (P16E4, P16E5) SENT Intenal Error Fault Active (P126F) Fuel Temperature Sensor SENT Message Error Fault Active (P128D) SENT Intenal Error Fault Pending (P126F) Fuel Temperature Sensor SENT Message Error Fault Pending (P128D)	40.00 failures out of 50.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Temperature Sensor 2 Circuit High Fault	P0188	This DTC diagnose SENT fuel rail temperature sensor 2 out of range low	Fuel Temperature Sensor 1 SENT digital read value	> 1,944.00	No Fault Active on No Fault Pending	Fuel Temperature Sensor Out of Range Diagnostic Enabled Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (P16E4, P16E5) SENT Intenal Error Fault Active (P126F) Fuel Temperature Sensor SENT Message Error Fault Active (P128D) SENT Intenal Error Fault Pending (P126F) Fuel Temperature Sensor SENT Message Error Fault Pending (P128D)	40.00 failures out of 50.00 samples 100 ms per Sample 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_StkPresMinFuelFlow (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)	Type B, 2 Trips

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		

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	Fuel Pressure Sensor Voltage Percent, 5.0V Nominal ((Abs(5.0V - SensorV_actual) /5.0V) *100)	< 4.00	Ignition circuit input state	High (Run or Crank)	64 failures / 80 samples 1 sample/12.5 ms	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 High	P018D	This DTC detects if the fuel pressure sensor circuit is shorted high	Fuel Pressure Sensor Voltage Percent, 5.0V Nominal ((Abs(5.0V - SensorV_actual) /5.0V) *100)	> 96.00	Ignition circuit input state	High (Run or Crank)	64 failures / 80 samples 1 sample/12.5 millisec	Type B, 2 Trips

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 Low Limit fail Filtered Fuel Control Error (Filtered Absolute delta between sensor1 and sensor2 High Limit Fail: Filtered Fuel Control Error (FIltered Absolute delta between sensor1 and sensor2	Low Limit fail <= **P0191 - KtFHPD_cmp_DPS_FailLoThrsh (Dual sensors)** (See supporting table) >= 1.00 mpa High Limit Fail: >= **P0191 - KtFHPD_cmp_DPS_FailHiThrsh (Dual Sensors)** (see Supporting table) >= 1.00 mpa Note: fuel control error is calcuated based on the squreroot of senor1 divided by sensor2, this value is filter to ensure proper failure	Commanded Pressure rate of change (increasing or dercresing) for a period of time Fuel pump temperature Desired pressure	Dual SENT Pressure Sensor Equipped SIDI High Pressure Sensor Performance Diagnostic Enabled < 3.00 mpa >= 1.25 seconds <= 1,000 degC >= -1.00 mpa Enabled when a code clear is not active or not exiting device control	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.
				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.
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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 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 >= 1 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 >= 1 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	Power driver output current (Fuel Pump Power Module Driver Circuit Ground Short enumeration)	Current >= 18.0 A (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate test state)	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) 9v < System V > 32v f] <> TRUE g] == TRUE h] < 75A	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 High	P0232	This DTC detects if the fuel pump control circuit is shorted to high voltage	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] 9v < System V > 32v f] <> TRUE g] == TRUE	64 failures / 80 samples 1 sample / 12.5 millisec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Engine Overboost Turbocharger with wastegate. Not supercharger with mechanical compressor	P0234	Detect Negative Boost Pressure Control Deviation	Desired Boost Pressure - Actual Boost Pressure	< refer to **P0234_KtBSTD_p_CntrlDevNegLim** - **P0234_P0299_KtBSTD_p_CntrlDevAmbAirCorr** in Supporting tables.	Diagnostic enable (Coolant temperature or OBD Coolant Enable Criteria and Coolant temperature Intake Air temperature is in range Ambient air pressure is in range Engine speed in range Desired Boost Pressure in range Desired Boost Pressure Derivative in range Wait for steady state: No active DTCs: Pressure Control has to be in closed loop. No Device control active for WG and Compresseor	True > -40.0 °C = TRUE) < 126.0 °C > -40.0 °C < 80.0 °C > 60.0 kPa < 120.0 kPa > 1,500 rpm < 6,500 rpm > 70.0 kPa < 245.0 kPa > -40.0 kPa/s < 50.0 kPa/s > refer to **P0234_P0299_KtBSTD_t_CntrlDevEnblDelay** in Supporting tables. BSTR_b_PCA_CktFA BSTR_b_TurboBypassCktFA ECT_Sensor_FA IAT_SensorFA BSTR_b_BoostSnsrFA AmbientAirDefault	18 failures out of 25 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.
					recirculation valve.			
			Actual Boost Pressure	> refer to **P0234_KtBSTD_p_CntrlDevBasLim** in Supporting tables. +Basic Pressure	Dev Diagnostic enable Basic Pres Diag enable (Coolant temperature or OBD Coolant Enable Criteria and Coolant temperature Intake Air temperature is in range Ambient air pressure is in range Engine speed in range Wait for steady state: No Active DTCs: Pressure Control has to be in open loop. No Device control active for WG and Compresseor recirculation valve.	True False > -40.0 °C = TRUE) < 126.0 °C > -40.0 °C < 80.0 °C > 60.0 kPa < 120.0 kPa > 1,900 rpm < 6,500 rpm > 2.00 Seconds BSTR_b_PCA_CktFA BSTR_b_TurboBypassCktFA ECT_Sensor_FA IAT_SensorFA BSTR_b_BoostSnsrFA AmbientAirDefault BSTR_b_PCA_TFTKO	25 failures out of 38 samples 100ms / sample	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Pressure (TIAP) Sensor Performance (twin turbo)	P0236	Determines if the Turbocharger Boost (TIAP) Pressure Sensor input is stuck within the normal operating range	See table **P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when either MAF1 model fails or MAF2 model fails. MAF1 model fails when ABS(Measured MAF1 Flow – Modeled MAF1 Flow) Filtered MAF2 model fails when ABS(Measured MAF2 Flow – Modeled MAF2 Flow) Filtered MAP1 model fails when ABS(Measured MAP – MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP – MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP – MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP - TIAP Model 1) Filtered TPS model fails when	 > 25.0 grams/sec > 25.0 grams/sec > 25.0 kPa > 25.0 kPa > 25.0 kPa > 30.0 kPa	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables.	>= 425 RPM <= 6,500 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Modeled MAF1 Error multiplied by **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM** and **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on MAF Est** Modeled MAF2 Error multiplied by **P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on MAF Est** and **P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on RPM**	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.
			Filtered Throttle Model Error TIAP Correlation model fails when High Engine Air Flow is TRUE AND Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset** OR Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset** TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time OR Low Engine Air Flow has been TRUE for a period of time High Engine Air Flow is TRUE when	> 350 kPa*(g/s) > 30.0 kPa > 30.0 kPa > 1.5 seconds > 1.5 seconds	No Active DTCs:	MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP1 Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM** TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM** Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Mass Air Flow	> a threshold in gm/sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow**	No Pending DTCs:	IAT_SensorFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP MnfdTempSensorCktFP		
			AND Manifold Pressure	> a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**				
			AND Filtered Mass Air Flow - Mass Air Flow	< 2.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm/sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP**				
			AND Mass Air Flow - Filtered					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Mass Air Flow	< 2.0 gm/sec				
			Turbocharger Boost Pressure OR Turbocharger Bosst Pressure OR ABS(Manifold Pressure - Turbocharger Boost Pressure) AND ABS(Manifold Pressure - Baro Pressure) AND ABS(Manifold Pressure - Baro Pressure 2) AND ABS(Turbocharger Boost Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure 2) AND ABS(Baro Pressure - Baro Pressure2)	< 50.0 kPa > 115.0 kPa > 10.0 kPa <= 10.0 kPa <= 10.0 kPa > 10.0 kPa > 10.0 kPa <= 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 10.0 seconds EngineModeNotRunTimerError MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP3_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP3_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Pressure Sensor Circuit Low (Gen III)	P0237	Detects a continuous short to low in either the signal circuit or the turbocharger boost pressure sensor.	Turbocharger Boost Pressure Voltage	< 14.4 % of 5 Volt Range (This is equal to 0.72 Volts, or 50.0 kPa)			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.
Turbocharger Boost Pressure Sensor Circuit High (Gen III)	P0238	Detects an open sensor ground, continuous short to high or open in either the signal circuit or the turbocharger boost pressure sensor.	Turbocharger Boost Pressure Voltage	> 68.5 % of 5 Volt Range (This is equal to 3.43 Volts, or 293.3 kPa)			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.
Turbo/Super Charger Intercooler Coolant Pump Control Circuit If Intercooler pump are present	P023A	Detect Intercooler Pump - Open Circuit	ECM detects that commanded and actual states of output driver do not match because the output is open circuit	Open circuit: ≥ 200 K Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	20 failures out of 100 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P023B may also set (Turbo/ Super Charger Intercooler Coolant Pump Control Circuit Low)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Intercooler Coolant Pump Control Circuit Low If Intercooler pump are present	P023B	Detect Intercooler Pump - Shorted to Ground	ECM detects that commanded and actual states of output driver do not match because the output is shorted to ground	Short to ground: ≤ 0.5 Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	20 failures out of 100 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P023A may also set (Turbo/ Super Charger Intercooler Coolant Pump Control Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Intercooler Coolant Pump Control Circuit High If Intercooler pump are present	P023C	Detect Intercooler Pump - Shorted to Power	ECM detects that commanded and actual states of output driver do not match because the output is shorted to power	Short to power: ≤ 0.5 Ω impedence between signal and controller power	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	20 failures out of 100 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.
Fuel Pump Secondary Circuit Open	P023F	This DTC detects if the fuel pump control circuit is open	Output driver current (Fuel Pump Power Module Driver Circuit Open enumeration)	Current <= 1.0 A (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate)	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] 9v < System V > 32v	40 test failures / 80 test samples; 1 sample/12.5ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Wastegate / Supercharger Boost Solenoid A Control Circuit	P0243	Detect Turbocharger Boost Solenoid -Open Circuit	ECM detects that commanded and actual states of output driver do not match because the output is open circuit	Open circuit: ≥ 200 K Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	50 failures out of 63 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P0245 may also set (Turbocharger Wastegate / Supercharger Boost Solenoid A Control Circuit Low)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Wastegate / Supercharger Boost Solenoid A Control Circuit Low	P0245	Detect Turbocharger Boost Solenoid - Shorted to ground	ECM detects that commanded and actual states of output driver do not match because the output is shorted to ground	Short to ground: ≤ 0.5 Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	50 failures out of 63 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P0243 may also set (Turbocharger Wastegate / Supercharger Boost Solenoid A Control Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Wastegate / Supercharger Boost Solenoid A Control Circuit High	P0246	Detect Turbocharger Boost Solenoid - Shorted to Power	ECM detects that commanded and actual states of output driver do not match because the output is shorted to power	Short to power: ≤ 0.5 Ω impedence between signal and controller power	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	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.
Turbocharger Wastegate / Supercharger Boost Solenoid B Control Circuit If two parallel turbos are present.	P0247	Detect Turbocharger Boost Solenoid B - Open Circuit	ECM detects that commanded and actual states of output driver do not match because the output is open circuit	Open circuit: ≥ 200 K Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	50 failures out of 63 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P0249 may also set (Turbocharger Wastegate / Supercharger Boost Solenoid B Control Circuit Low)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Wastegate / Supercharger Boost Solenoid B Control Circuit Low If two parallel turbos are present.	P0249	Detect Turbocharger Boost Solenoid B - Shorted to ground	ECM detects that commanded and actual states of output driver do not match because the output is shorted to ground	Short to ground: ≤ 0.5 Ω impedence between signal and controller ground	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	50 failures out of 63 samples 100ms / sample	Type B, 2 Trips Note: In certain controllers P0247 may also set (Turbocharger Wastegate / Supercharger Boost Solenoid B Control Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Wastegate / Supercharger Boost Solenoid B Control Circuit High If two parallel turbos are present.	P0250	Detect Turbocharger Boost Solenoid B - Shorted to Power	ECM detects that commanded and actual states of output driver do not match because the output is shorted to power	Short to power: ≤ 0.5 Ω impedence between signal and controller power	Diagnostic Enabled EnabledPowertrain relay Voltage Ignition run crank voltage Engine is not cranking Diagnostic System not Disabled	True >= 11.0 Volts > 5.00 Volts	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.
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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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.
Turbocharger or Supercharger with Intercooler	P026A	Charging Intercooler Efficiency	IAT3 Temperature OR Lengthy boost limiting due to elevated manifold temperature	> 110.0 > 10,000.0	Diagnostic Enabled IC Pump Enabled Engine Run Time Coolant Temp No active DTCS:	True 'dynamic' >= 60.00 seconds >= -10.00 deg Celsius ECT_Sensor_FA MnfdTempSensorFA	5 failures out of 10 samples. 100ms / sample	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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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.
Turbo/Super Charger Engine Underboost Turbocharger with wastegate. Not supercharger with mechanical compressor	P0299	Detect Positive Boost Pressure Control Deviation	Desired Boost Pressure - Actual Boost Pressure	<refr to **P0299_KtBSTD_p_CntrlDevPosLim** + **P0234_P0299_KtBSTD_p_CntrlDevAmbAirCorr** in Supporting tables.	Diagnostic enable (Coolant temperature or OBD Coolant Enable Criteria and Coolant temperature Intake Air temperature is in range Ambient air pressure is in range Engine speed in range Desired Boost Pressure in range Desired Boost Pressure Derivative in range Wait for steady state: No active DTCs: Pressure Control has to be in closed loop.	True > -40.0 °C = TRUE) < 126.0 °C > -40.0 °C < 80.0 °C > 60.0 kPa < 120.0 kPa > 1,500 rpm < 6,500 rpm > 70.0 kPa < 245.0 kPa > -40.0 kPa/s < 50.0 kPa/s > refer to **P0234_P0299_KtBSTD_t_CntrlDevEnblDelay** in Supporting tables. BSTR_b_PCA_CktFA BSTR_b_TurboBypassCktFA ECT_Sensor_FA IAT_SensorFA BSTR_b_BoostSnsrFA AmbientAirDefault	18 failures out of 25 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.
					No Device control active for WG and Compresseor recirculation valve.			
			Actual Boost Pressure delta (the delta is limited by these tables: refer to Max: **P0299_KtBSTD_p_CntrlDevDsrdRtHi** Min: **P0299_KtBSTD_p_CntrlDevDsrdRtLo** in Supporting tables.	< 15.00	Diagnostic enable RateBas Diagostic enable (Coolant temperature or OBD Coolant Enable Criteria and Coolant temperature Intake Air temperature is in range Ambient air pressure is in range Desired Boost Pressure in range Desired Boost Pressure Derivative in Hyst.Rang Engine speed is in range Wait for steaty state: No active DTCs: Pressure Control has to be in open loop.	True False > -40.0 °C = TRUE) < 126.0 °C > -40.0 °C < 80.0 °C > 60.0 kPa < 120.0 kPa > 70.0 kPa < 245.0 kPa Enable Limit: 20.0 Disable Limit: -5.0 > 1,900 rpm < 6,500 rpm > 0.20 Seconds BSTR_b_PCA_CktFA BSTR_b_TurboBypassCktFA ECT_Sensor_FA IAT_SensorFA BSTR_b_BoostSnsrFA AmbientAirDefault	10 failures out of 20 samples 100ms / sample	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No Device control active for WG and Compresseor recirculation valve.			

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	P0300 P0301 P0302 P0303 P0304 P0305 P0306	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 > **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 < 128 ºC < -7 ºC 21 ºC < ECT < 128 ºC 9.00 < volts < 32.00 < 60.00 % per 25 ms < 90.00 % 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.
			********** *Feature not used on Gasoline engines Combustion Modes that force selection of Idle Tables ********** Other patterns of misfire use adjustments to the single cylinder continuous misfire threshold tables: RANDOM MISFIRE Use random misfire thresholds If no misfire for (Medres_Decel AND Medres_Jerk) OR (Medres_Decel AND Medres_Jerk) OR (Lores_Decel AND Lores_Jerk) OR (Lores_Decel	********** *Feature not used on Gasoline engines **CombustModeIdleTbl** in Supporting Tables ********** > 5 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** * **RandomCylModJerk** > **CylModeDecel** *			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.
				RandomCylModDecel				
			AND Lores_Jerk)	> **CylModeJerk** * **RandomCylModJerk**				
			OR RevBalanceTime	> **RevMode_Decel** * **RandomRevModDecl**				
			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					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			(within one engine cycle: 2nd largest Lores_Decel) AND Above TRUE for))	> **CylModeDecel * PairCylModeDecel** > 40 engine cycles out of 100 engine cycles				
			BANK MISFIRE Cylinders above Bank Thresholds (Medres_Decel AND Medres_Jerk)	>= 3 cylinders > **IdleSCD_Decel** * **Bank_SCD_Decel** > **IdleSCD_Jerk** * **Bank_SCD_Jerk**				
			OR (Medres_Decel AND Medres_Jerk)	> **SCD_Decel** * **Bank_SCD_Decel** > **SCD_Jerk** * **Bank_SCD_Jerk**				
			OR (Lores_Decel AND Lores_Jerk)	> **IdleCyl_Decel** * **BankCylModeDecel** >**IdleCyl_Jerk** * **BankCylModeJerk**				
			OR (Lores_Decel AND Lores_Jerk)	> **CylModeDecel** * **BankCylModeDecel** > **CylModeJerk** * **BankCylModeJerk**				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			CONSECUTIVE CYLINDER MISFIRE 1st cylinder uses single cyl continuous misfire thresholds; 2nd Cylinder uses: (Medres_Decel	> **IdleSCD_Decel** * **ConsecSCD_Decel** AND > **IdleSCD_Jerk** * **ConsecSCD_Jerk**				
			OR (Medres_Decel	> **SCD_Decel** * **ConsecSCD_Decel** AND > **SCD_Jerk** * **ConsecSCD_Jerk**				
			OR (Lores_Decel	> **IdleCyl_Decel** * **ConsecCylModDecel** AND > **IdleSCD_Jerk** * **ConsecCylModeJerk**				
			OR (Lores_Decel	> **CylModeDecel** * **ConsecCylModDecel** AND > **CylModeJerk** * **ConsecCylModeJerk**				
			CYLINDER DEACTIVATION MODE (Active Fuel Managment) AFM: SINGLE CYLINDER					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			CONTINUOUS MISFIRE (CylAfterDeacCyl_Decel AND CylAfterDeacCyl_Jerk) OR (CylBeforeDeacCylDecel AND CylBeforeDeacCyl_Jerk) AFM: RANDOM MISFIRE Use random misfire thresholds If no misfire for (CylAfterDeacCyl_Decel AND CylAfterDeacCyl_Jerk) (CylBeforeDeacCylDecel AND CylBeforeDeacCyl_Jerk)	> **CylModeDecel** * **ClyAfterAFM_Decel** > **CylModeJerk** * **CylAfterAFM_Jerk** > **CylModeDecel** * **CylBeforeAFM_Decel** > **CylModeJerk** * **ClyBeforeAFM_Jerk** > 5 Engine Cycles > **CylModeDecel** * **ClyAfterAFM_Decel** * **RandomAFM_Decl** > **CylModeJerk** * **CylAfterAFM_Jerk** * **RandomAFM_Jerk** > **CylModeDecel** * **CylBeforeAFM_Decel** * **RandomAFM_Decl** > **CylModeJerk** * **ClyBeforeAFM_Jerk** * **RandomAFM_Jerk** - see details on Supporting Tables Tab				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Misfire Percent Emission Failure Threshold	≥ 2.08 % P0300				
			Misfire Percent Catalyst Damage	> **Catalyst_Damage_Misfire_Percentage** in Supporting Tables whenever secondary conditions are met.	(at low speed/loads, one cylinder may not cause cat damage) Engine Speed Engine Load Misfire counts	 > 1,500 rpm AND > 30 % load AND < 180 counts on one cylinder		
			When engine speed and load are less than the FTP cals (3) catalyst damage exceedences are allowed.	≤ 0 FTP rpm AND ≤ 0 FTP % load				
				disable conditions:	Engine Speed	400 < rpm < ((Engine Over Speed Limit) - 150) OR 8,191) Engine speed limit is a function of inputs like Gear and temperature see **EngineOverSpeedLimit** in supporting tables	4 cycle delay	
					No active DTCs:	TPS_FA EnginePowerLimited	4 cycle delay	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						MAF_SensorTFTKO MAP_SensorTFTKO IAT_SensorTFTKO ECT_Sensor_Ckt_TFTKO 5VoltReferenceB_FA CrankSensor_TFTKO CrankSensor_FA 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** or <**ZeroTorqueAFM** if AFM is active	4 cycle delay	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						in Supporting Tables		
					Below zero torque: TPS Vehicle Speed	≤ 0.6 % (≤ 2.0 % in AFM) > 30 mph (> 19 mph AFM)	4 cycle delay	
					NEGATIVE TORQ AFM If deactivated cylinders appear to make power, torque is negative: DeactivatedCyl_Decel AND DeactivatedCyl_Jerk AND # of Deact Cyls Inverted	 <**DeacCylInversionDecel** <**DeacCylInversionJerk** > 2 cylinders	2 cycle delay	
					EGR Intrusive test	Active	0 cycle delay	
					Manual Trans	Clutch shift	4 cycle delay	
					Accel Pedal Position AND Automatic transmission shift	> 95.00 %	7 cycle delay	
					After Fuel resumes on Automatic shift containing Fuel Cut		2 Cylinder delay	
					Delay if PTO engaged	Enabled	4 cycle delay	
					********** *Feature not used on Gasoline engines	**********	**********	
					Combustion Mode	= **InfrequentRegen** value	4 cycle delay	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						in Supporting Tables		
					Driver cranks before Wait to Start lamp extinguishes	IF TRUE	**WaitToStart** cycle delay	
					Brake Torque **********	> 199.99 % Max Torque **********	4 cycle 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:	> "**Ring Filter**" # of engine cycles after misfire in Supporting Tables		
					Stop filter early:	> "**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 % > 900 rpm > 3 mph not shifting		
					indivdual candidate deemed abnormal if			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					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 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 MISFIRE CRANKSHAFT PATTERN RECOGNITION checks each "misfire" candidate in 100 engine Cycle test to see if overall crankshaft pattern looks like real misfire (recognized), or some disturbance like rough road (unrecognized). At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real	> **Abnormal SCD Mode** > **Abnormal Cyl Mode** > **Abnormal Rev Mode** in Supporting Tables > 0.50 ratio	discard 100 engine cycle test	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					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	Not Enabled		
					Pattern Recog Enabled consecutive cyl pattrn	Enabled		
					Engine Speed Veh Speed	1,000 < rpm < 6,500 > 0.6 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 AND CylAfter_Jerk)	> Misfire_ decel * **1st_FireAftrMisfr_Acel** > Misfire_Jerk * **1st_FireAftrMisfr_Jerk** Or if AFM mode is active: > Misfire_ decel * **1stFireAftrMisAcelAFM** > Misfire_Jerk * **1stFireAfterMisJerkAFM**		

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	2 Cylinders		
					"misfire" recognized if: Crankshaft snap after: isolated "misfire"	< Misfire_Jerk *** SnapDecayAfterMisfire**		
					repetative "misfire"	< Misfire_Jerk * **SnapDecayAfterMisfire * RepetSnapDecayAdjst** in Supporting Tables		
					At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present.			
					Ratio of Unrecog/Recog	> 0.70	discard 100 engine cycle test	

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

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 tooth values	Differance between 360 degrees and the sum of the reluctor wheel's teeth	> 0.001 degrees	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 Excessive Knock (either real or false knock).	Common Enable Criteria		Diagnostic Enabled?	Yes	First Order Lag Filters with Weight Coefficient = 0.0300 Updated each engine event	Type B, 2 Trips
					Engine Run Time	≥ 2.0 seconds		
					Engine Speed	≥ 400 RPM AND ≤ 8,500 RPM		
					Engine Air Flow	≥ 400 mg/cylinder AND ≤ 2,000 mg/cylinder		
					(Engine Coolant Temperature OR OBD Coolant Enable Criteria	≥ -40 deg's C = TRUE)		
			Excessive Knock Diag: Filtered Knock Intensity	**> P0324_PerCyl_ExcessiveKnock_Threshold** (no units)	Inlet Air Temperature	≥ -40 deg's C		
			(where 'Knock Intensity' = 0 with no knock; and > 0 & proportional to knock magnitude with knock)		Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	≥ 134 Revs		

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. There are two possible methods used: 1. 20 kHz 2. Normal Noise See **Supporting Tables** for method definition: **P0325_P0330_OpenMethod** Typical implementations: A. Use 20 kHz method at all RPM (used when acceptable separation achieved at all RPM) or B. Use 20 kHz method at low/medium RPM and Normal Noise at high RPM	Open Circuit Method chosen (2 possible methods: 20 kHz or Normal Noise): Thresholds for OpenMethod = 20 kHZ Filtered FFT Output Thresholds for OpenMethod = NormalNoise: Filtered FFT Output	Supporting Table: **P0325_P0330_OpenMethod_2** (see Supporting Tables) **> P0325_P0330_OpenCktThrshMin (20 kHz) AND < P0325_P0330_OpenCktThrshMax (20 kHz)** **> P0325_P0330_OpenCktThrshMin (Normal Noise) AND < P0325_P0330_OpenCktThrshMax (Normal Noise)**	Diagnostic Enabled? Engine Run Time Engine Speed Cumulative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow (Engine Coolant Temperature OR OBD Coolant Enable Criteria Inlet Air Temperature	Yes ≥ 2.0 seconds ≥ 400 RPM and ≤ 8,500 RPM ≥ 67 revs ≥ 50 mg/cylinder and ≤ 2,000 mg/cylinder ≥ -40 deg's C = TRUE) ≥ -40 deg's C	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0100 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 Abnormal (engine) Noise	Enable Criteria for Per Sensor Abnormal Noise Diag:		Diagnostic Enabled? Engine Run Time Engine Speed Engine Air Flow (Engine Coolant Temperature OR OBD Coolant Enable Criteria Inlet Air Temperature	Yes ≥ 2.0 seconds ≥ 2,300 RPM AND ≤ 8,500 RPM ≥ 50 mg/cylinder AND ≤ 2,000 mg/cylinder ≥ -40 deg's C = TRUE) ≥ -40 deg's C	First Order Lag Filters with Weight Coefficient = 0.0030 Updated each engine event	Type B, 2 Trips
			Filtered FFT Intensity: (where 'FFT Intensity' = Non-knocking, background engine noise)	< **P0326_P0331_AbnormalNoise_Threshold** (Supporting Table)	Individual Cylinders enabled for Abnormal Noise Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	**P0326_P0331_AbnormalNoise_CylsEnabled** (Supporting Table) ≥ 445 Revs		

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 There are two possible methods used: 1. 20 kHz 2. Normal Noise See **Supporting Tables** for method definition: **P0325_P0330_OpenMethod** Typical implementations: A. Use 20 kHz method at all RPM (used when acceptable separation achieved at all RPM) or B. Use 20 kHz method at low/medium RPM and Normal Noise at high RPM	**Open Circuit Method chosen** (2 possible methods: 20 kHz or Normal Noise): **Thresholds for OpenMethod = 20 kHZ** Filtered FFT Output **Thresholds for OpenMethod = NormalNoise:** Filtered FFT Output	Supporting Table: **P0325_P0330_OpenMethod_2** (See Supporting Tables) **> P0325_P0330_OpenCktThrshMin (20 kHz) AND < P0325_P0330_OpenCktThrshMax (20 kHz)** **> P0325_P0330_OpenCktThrshMin (Normal Noise) AND < P0325_P0330_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 (Engine Coolant Temperature OR OBD Coolant Enable Criteria Inlet Air Temperature	Yes ≥ 2.0 seconds ≥ 400 RPM and ≤ 8,500 RPM ≥ 67 revs ≥ 50 mg/cylinder and ≤ 2,000 mg/cylinder ≥ -40 deg's C = TRUE) ≥ -40 deg's C	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0100 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 Abnormal (engine) Noise	Enable Criteria for Per Sensor Abnormal Noise Diag: Filtered FFT Intensity: (where 'FFT Intensity' = Non-knocking, background engine noise)	< **P0326_P0331_AbnormalNoise_Threshold** (Supporting Table)	Diagnostic Enabled? Engine Run Time Engine Speed Engine Air Flow (Engine Coolant Temperature OR OBD Coolant Enable Criteria Inlet Air Temperature Individual Cylinders enabled for Abnormal Noise Cumlative Number of Engine Revs Above Min Eng Speed (per key cycle)	Yes ≥ 2.0 seconds ≥ 2,300 RPM AND ≤ 8,500 RPM ≥ 50 mg/cylinder AND ≤ 2,000 mg/cylinder ≥ -40 deg's C = TRUE) ≥ -40 deg's C **P0326_P0331_AbnormalNoise_CylsEnabled** (Supporting Table) ≥ 445 Revs	First Order Lag Filters with Weight Coefficient = 0.0030 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) 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 (MAF_SensorFA AND Engine Air Flow	 = FALSE > 3.0 grams/second))	Continuous every 100 msec	Type B, 2 Trips
			No crankshaft pulses received	>= 0.1 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:	 P0365 P0366	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 4 or more crank re-synchronizations occur	< 4.0 seconds	Engine Air Flow Cam-based engine speed No DTC Active:	>= 3.0 grams/second > 60 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 (MAF_SensorFA AND Engine Air Flow	 = 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:	 P0365 P0366	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 (crank pulses being received OR (MAF_SensorFA AND Engine Air Flow	= 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 12 MEDRES events (There are 12 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 12 MEDRES events is OR (There are 12 MEDRES events per engine cycle)	< 4 > 6	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	Type B, 2 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	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 Circuit Bank 2 Sensor A	P0345	Determines if a fault exists with the cam position bank 2 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 (crank pulses being received OR (MAF_SensorFA AND Engine Air Flow	= 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 12 MEDRES events (There are 12 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 2 Sensor A	P0346	Determines if a performance fault exists with the cam position bank 2 sensor A signal	The number of camshaft pulses received during first 12 MEDRES events is OR (There are 12 MEDRES events per engine cycle)	< 4 > 6	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	Type B, 2 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	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.
IGNITION CONTROL #1 CIRCUIT	P0351	Diagnoses Cylinder #1 Ignition Control (EST) output driver circuit for an Open Circuit fault.	The ECM detects there is high impedance on the EST circuit.	≥ 30 kΩ impedance between signal and controller ground	Engine cranking or running Ignition Voltage	 > 5.00 Volts	50 Failures out of 63 Samples 250 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	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	 > 11.0 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)	≥ 30 kΩ impedance between signal and controller ground	Engine running Ignition Voltage	 > 11.0 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	 > 11.0 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	P0355	Diagnoses Cylinder #5 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	 > 11.0 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	 > 11.0 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.
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor B	P0365	Determines if a fault exists with the cam position bank 1 sensor B 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 (crank pulses being received OR (MAF_SensorFA	= 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 12 MEDRES events (There are 12 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 B	P0366	Determines if a performance fault exists with the cam position bank 1 sensor B signal	The number of camshaft pulses received during first 12 MEDRES events is OR (There are 12 MEDRES events per engine cycle)	< 4 > 6	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	Type B, 2 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	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 Circuit Bank 2 Sensor B	P0390	Determines if a fault exists with the cam position bank 2 sensor B 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 (crank pulses being received OR (MAF_SensorFA AND Engine Air Flow	= 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 12 MEDRES events (There are 12 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 2 Sensor B	P0391	Determines if a performance fault exists with the cam position bank 2 sensor B signal	The number of camshaft pulses received during first 12 MEDRES events is OR (There are 12 MEDRES events per engine cycle)	< 4 > 6	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	Type B, 2 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	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.
Catalyst System Low Efficiency Bank 1	P0420	NOTE: The information below applies to applications that use the Decel Catalyst Monitor Algorithm Oxygen Storage. 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 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)	< 0.35	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. MAF Predicted catalyst temperature General Enable Criteria In addition to the p-codes listed under P2270, the following DTC's shall also not be set: For switching O2 sensors:	> 0.54 < 0.10 6 > 2.00 g/s < 20.00 g/s < 1,000 ° C	1 test attempted per valid decel period Minimum of 1 test per trip Maximum of 4 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_WorstPassingOSCTableB1** and **P0420_BestFailingOSCTableB1** 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			For WRAF O2 sensors:	O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA WRAF_Bank_1_FA WRAF_Bank_2_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		listed in the "Secondary 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 Storage. 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 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)	< 0.35	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. MAF Predicted catalyst temperature General Enable Criteria In addition to the p-codes listed under P2272, the following DTC's shall also not be set: For switching O2 sensors:	> 0.56 < 0.10 6 > 2.00 g/s < 20.00 g/s < 1,000 ° C O2S_Bank_1_Sensor_1_FA	1 test attempted per valid decel period Minimum of 1 test per trip Maximum of 4 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_WorstPassingOSCTableB2** and **P0430_BestFailingOSCTableB2** 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			For WRAF O2 sensors:	O2S_Bank_1_Sensor_2_FA O2S_Bank_2_Sensor_1_FA O2S_Bank_2_Sensor_2_FA WRAF_Bank_1_FA WRAF_Bank_2_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		listed in the "Secondary 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 with EAT using IAT 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.	> 0.57 (EWMA Fail Threshold), ≤ 0.35 (EWMA Re-Pass Threshold)	Fuel Level Drive Time Drive length (ECT OR OBD Coolant Enable Criteria 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 at end of drive Estimate of Ambient Air Temperature Valid ****************************** Conditions for Estimate of	10 % ≤ Percent ≤ 90 % ≥ 600 seconds ≥ 5.0 miles ≥ 63 °C = TRUE) ≥ 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 conditions 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) Pa from peak pressure, the vent is then opened for 60 seconds to normalize the system pressure. The vent is again closed to begin the vacuum portion of the test (phase-2). As the fuel temperature continues to fall, a vacuum will begin forming. The vacuum will continue until it reaches a vacuum peak. When the pressure rises 62 Pa from vacuum peak, the test then completes. If the key is turned on while the diagnostic test is in progress, the test will abort.			Ambient Air Temperature to be valid: 1. Cold Start Startup delta deg C (ECT-IAT) OR 2. Short Soak and Previous EAT Valid Previous time since engine off OR 3. Less than a short soak and Previous EAT Not Valid Previous time since engine off AND Vehicle Speed AND Mass Air Flow Must expire Estimate of Ambient Temperature Valid Conditioning Time. **P0442 Estimate of Ambient Temperature Valid Conditioning Time as a Function of Ign Off Time Table** in Supporting Tables. OR 4. Not a Cold Start and greater than a Short Soak Previous time since	 ≤ 8 °C ≤ 7,200 seconds ≤ 7,200 seconds ≥ 40 mph ≥ 8 g/sec		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					engine off AND Vehicle Speed AND Mass Air Flow Must expire maximum value in Estimate of Ambient Temperature Valid Conditioning Time. Please see **P0442 Estimate of Ambient Temperature Valid Conditioning Time as a Function of Ign Off Time Table** in Supporting Tables. ********** 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 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	> 7,200 seconds ≥ 40 mph ≥ 8 g/sec ********** < -5		

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					during the EONV test OR 7. Key up during EONV test No active DTCs: No Active DTC's TFTKO	 MAF_SensorFA ECT_Sensor_FA IAT_SensorFA VehicleSpeedSensor_FA IgnitionOffTimeValid AmbientAirDefault P0443 P0446 P0449 P0452 P0453 P0455 P0458 P0459 P0498 P0499 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	Powertrain relay voltage	Voltage ≥ 11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0458 may also set (Canister Purge Solenoid Short to Ground)

Component/ System	Fault Code	Monitor 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 ≥ 6 liters	Fuel Level System Voltage Startup IAT Startup ECT BARO No active DTCs: No Active DTC's TFTKO	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 P0458 P0459 P0498 P0499	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 (97.0 % 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 >15 %	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes and the canister vent solenoid is closed		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period.The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.The test will report a failure if 2 out of 3 samples are failures. 12.5 ms / sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor 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.	> 15 liters ≤ 2,740 Pa ≥ 2,740 Pa	Fuel Level System Voltage BARO Purge Flow No active DTCs: No Active DTC's TFTKO 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 ≥ 1.50 % MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454 P0458 P0459 P0498 P0499 ≤ 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	Powertrain relay voltage	Voltage ≥ 11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0443 may also set (Canister Purge Solenoid Open Circuit)

Component/ System	Fault Code	Monitor 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	Powertrain relay voltage	Voltage ≥ 11.0 volts	20 failures out of 25 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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 used If fuel volume in primary tank is and fuel volume in secondary tank is and remains in this condition for of fuel consumed by the engine. OR ********** During Fuel Transfer ********** During fuel transfer, when the enable conditions are met, at least 3.0 liters of fuel will be transferred from the secondary tank and 3.0 liters of fuel will be transferred into the primary tank within 25 seconds. There is a short delay of 20 seconds to allow fuel slosh to settle before the fail timer begins. If the secondary	≥ 28.7 liters < 2.8 liters 18.5 liters	Engine Running No active DTCs: Transfer pump is commanded on for the maximum time limit referenced in **P0461 P2066 P2636 Transfer Pump Enable Time Table** (see Supporting Table) No device control for the transfer pump Fuel Volume in Secondary Tank	VehicleSpeedSensor_FA < 10 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.
			tank volume does decrease by the cal amount but the primary volume does not increase by the cal amount after the fail timer has expired, then P0461 sets. OR ********** Fuel consumed without a Primary Fuel Level Change ********** Delta fuel volume change for of fuel consumed by the engine.	 < 3 liters 20.0 liters	Vehicle Speed	< 0 mph		

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

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.	 > 15 % > 15 %	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period.The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.The test will report a failure if 2 out of 3 samples are failures. 100 ms / sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor 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: No Active DTC's TFTKO	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 P0458 P0459 P0498 P0499	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.
Transmission Output Speed Sensor (TOSS)	P0502	No activity in the TOSS circuit	TOSS Raw Speed	≤ 60 RPM	Engine Torque	90.0 ≤ N-M ≤ 8,191.8	≥ 4.5 sec	Type A, 1 Trips
					Minimum Throttle opening	≥ 8.0 %		
					Engine Speed	1,500 ≤ RPM ≤ 6,500		
					Ignition voltage	11.0 ≤ Volts ≤ 32.00		
					PTO	not active		
					EngineTorqureInaccurate	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,		
					P0503	Not failed this key cycle		

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 11.0 ≤ Volts ≤ 32.00 200 ≤ RPM ≤ 7,500 for ≥ 5.0 seconds ≤ 511.99 MPH for ≥ 5.0 sec not active	≥ 3.3 sec	Type A, 1 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	> 94.00 rpm	Baro	> 70 kPa	Diagnostic runs in every 12.5 ms loop	Type B, 2 Trips
			filter coefficient	0.00350	Coolant Temp	> KeSPDD_T_EnblECT_Min (60 °C) and < KfECTI_T_EngCoolHotHi Thresh (127 °C) Must verify KfECTI_T_EngCoolHotLo Thresh (123) is less than KfECTI_T_EngCoolHotHi Thresh (127)	Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	
					Engine run time	≥ 60 sec		
					Ignition voltage	255 ≥ 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	> 5 sec		
					For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 90.00 pct < 15.00 pct		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						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		
					No active DTCs	TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA		

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 > 5 sec The diagnostic does not run during autostop as engine is shutdown during that time (occurs in a hybrid or 12v start stop vehicle)		

Component/ System	Fault Code	Monitor 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	< -188.00 rpm	Baro	> 70 kPa	Diagnostic runs in every 12.5 ms loop	Type B, 2 Trips
			filter coefficient	0.00350	Coolant Temp	> KeSPDD_T_EnblECT_Min (60 °C) and < KfECTI_T_EngCoolHotHiThresh (127 °C) Must verify KfECTI_T_EngCoolHotLoThresh (123) is less than KfECTI_T_EngCoolHotHiThresh (127)	Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	
					Engine run time	≥ 60 sec		
					Ignition voltage	255 ≥ 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	> 90.00 pct < 15.00 pct		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						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		
					No active DTCs	TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA		

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	FuelLevelDataFaultLow FuelConditionDiagnostic Clutch SensorFA AmbPresDfltdStatus P2771 > 5 sec The diagnostic does not run during autostop as engine is shutdown during that time (occurs in a hybrid or 12v start stop vehicle)		

Component/ System	Fault Code	Monitor 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 < 350.00 degC > -10.00 degC <= 56.00 degC >= 74.00 KPa >= 450.00 RPM <= 2,200.00 RPM <= 1.00 Pct < 20 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	>= 900.00 degC >= 18.38 seconds		
					OR Engine Run Time	> **P050D_P1400_CatalystLightOffExtendedEngineRunTimeExit** This Extended Engine run time exit table is a function of percent ethanol and Catmons NormRatioEWMA. Refer to "Supporting Tables" for details.		
					OR Barometric Pressure	< 74.00 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	> 2,400.00 RPM > 2.00 Pct		
					Engine Run Time	>= 20 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 CrankSensor_FA FuelInjectorCircuit_FA MAF_SensorFA MAP_SensorFA AnyCamPhaser_TFTKO ClutchPstnSnsr 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 EngineTorqueEstInaccurate FuelPumpRlyCktFA		

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) *100	< 5.00 percent	Engine Speed Enable Engine Speed Disable Oil Pressure Sensor In Use Diagnostic Status	> 400 rpm < 350 rpm Yes 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.
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) *100	> 95.00 percent	Oil Pressure Sensor In Use Diagnostic Status	Yes 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.
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	Type C, No SVS , special type C

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	Type C, No SVS , special type C

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	Type C, No SVS , special type C

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	Type C, No SVS , special type C

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	Type C, No SVS , special type C

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 or Cruise and Speed Limiter 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	Type C, No SVS , special type C

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	Type C, No SVS , special type C

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	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Multi-Function Input B Circuit	P0589	Detect when cruise control multi-function switch circuit B (analog) voltage is in an illegal range	Cruise Control analog circuit B 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	Type C, No SVS ,special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Multi-Function Input B Circuit Low	P0592	detects short to ground failure for cruise multi-function switch circuit B	Cruise Control analog circuit B 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	Type C, No SVS ,special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Multi-Function Input B Circuit High	P0593		Cruise Control analog circuit B 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	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
ColdStrtA_CamPstnB1	P05CC	Detects a VVT system error during Cold Starts 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 > 4.00 deg.	**Intake Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active **Catalyst Warmup Enabled** Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 Volts = TRUE = FALSE = TRUE > 0 deg > 4.00 deg AND < 21.00 deg < 4.50 deg for (**P0011_P05CC_StablePositionTimeIc1**) seconds P0010 P2088 P2089	40 failures out of 100 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.
ColdStrtA_CamPstnB2	P05CD	Detects a VVT system error during Cold Starts 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 2) Cam Position Error > 4.00 deg.	**Intake Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active **Catalyst Warmup Enabled** Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 Volts = TRUE = FALSE = TRUE > 0 deg > 4.00 deg AND < 21.00 deg < 4.50 deg for (**P0021_P05CD_StablePositionTimeIc2**) seconds P0020 P2092 P2093	40 failures out of 100 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.
ColdStrtB_CamPstnB1	P05CE	Detects a VVT system error during Cold Starts 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	(Exhaust cam Bank 1) Cam Position Error > 4.00 deg.	**Exhaust Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active **Catalyst Warmup Enabled** Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 volts = TRUE = FALSE = TRUE > 0 deg > 4.00 deg AND < 21.00 deg < 4.50 deg for (**P0014_P05CE_StablePositionTimeEc1**) sec P0013 P2090 P2091	40 failures out of 100 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.
ColdStrtB_CamPstnB2	P05CF	Detects a VVT system error during Cold Starts 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	(Exhaust cam Bank 2) Cam Position Error > 4.00 deg.	**Exhaust Cam Phsr Enable** System Voltage Engine Running Power Take Off (PTO) active **Catalyst Warmup Enabled** Desired cam position Desired AND Measured cam position Desired cam position variation No Active DTCs	= TRUE > 11.00 Volts = TRUE = FALSE = TRUE > 0 deg > 4.00 deg AND < 21.00 deg < 4.50 deg for (**P0024_P05CF_StablePositionTimeEc2**) seconds P0023 P2094 P2095	40 failures out of 100 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.
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				

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 ECU is a service part that has not been programmed.	Service (reflash) controller calibration present	= 1		none	Diagnostic runs at powerup and once per second continuously after that	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
ECM Long Term Memory Reset	P0603	This DTC detects an invalid NVM.	Static NVM region error detected during initialization				Diagnostic runs at controller power up.	Type A, 1 Trips
			Perserved NVM region error detected during initialization				Diagnostic runs at controller power up.	
			ECC ROM fault detected in NVM Flash region ECC ROM Error Count >	3			Diagnostic runs at controller power up.	
			Perserved NVM region error detected during shut down.				Diagnostic runs at controller power down.	

Component/ System	Fault Code	Monitor 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 >	0.46363 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, 64 / 161 counts intermittent or 0.1875 s continuous; 0.4875 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_MainCPU_SOH_FltEnbld is: 1 . (If 0, this test is disabled) time from initialization >= 0.5000 seconds	50 ms	
			Software background task first pass time to complete exceeds			Run/Crank voltage > 6.41	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(Core, Loop Time). See supporting tables: **P0606_Program Sequence Watch Enable f(Core, Loop Time)** (If 0, this Loop Time test is disabled)	Fail Table, f(Loop Time). See supporting tables: **P0606_PSW Sequence Fail f (Loop Time)** / Sample Table, f (Loop Time)See supporting tables: **P0606_PSW Sequence Sample f(Loop Time)** counts 50 ms/count in the ECM main processor	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			MAIN processor determines a seed has not changed within a specified time period within the 50ms task.	Previous seed value equals current seed value.		KePISD_b_SeedUpdKey StorFltEnbl == 1 Value of KePISD_b_SeedUpdKey StorFltEnbl is: 1 . (If 0, this test is disabled)	Table, f(Loop Time). See supporting tables: **P0606_Last Seed Timeout f (Loop Time)**	

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 ≥ 11.00 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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Internal Control Module EEPROM Error	P062F	This DTC detects a NVM long term performance.	HWIO reports that writing to NVM (at shutdown) will not succeed				Diagnostic runs at controller power up.	Type A, 1 Trips
			HWIO reports the assembly calibration integrity check has failed				Diagnostic runs at controller power up.	

16 OBDG05 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

16 OBDG05 ECM Summary Tables (Initial DTCs)

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 ≥ 11.00 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 ≥ 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0686 may also set (Powertrain Relay Control Short to Ground).

Component/ System	Fault Code	Monitor 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 ≥ 11.00 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 ≥ 11.00 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).

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

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	**> P06B6_P06B7_OpenTestCktThrshMin** **AND** **< P06B6_P06B7_OpenTestCktThrshMax** **See Supporting Tables**	Diagnostic Enabled? Engine Run Time Engine Speed Cumlative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow	Yes ≥ 2.0 seconds > 400 RPM and < 7,200 RPM ≥ 200 Revs ≥ 50 mg/cylinder and ≤ 2,000 mg/cylinder	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0200 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.
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	**> P06B6_P06B7_OpenTestCktThrshMin** **AND** **< P06B6_P06B7_OpenTestCktThrshMax** **See Supporting Tables**	Diagnostic Enabled? Engine Run Time Engine Speed Cumlative Number of Engine Revs (per key cycle) within min/max Engine Speed enable (above) Engine Air Flow	Yes ≥ 2.0 seconds > 400 RPM and < 7,200 RPM ≥ 200 Revs ≥ 50 mg/cylinder and ≤ 2,000 mg/cylinder	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0200 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.
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 ≥ 11.00 volts ≤ 32.00 volts = False ≥ 10.00 Nm ≥ 8,192.00 rpm ≥ 0.00 Pct ≤ 0.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 5.00 ratio < 5.50 ratio ≥ 0.20 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 0.20 seconds Once the above fail time is achieved then increment the fail counter once ≥ 5.00 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 ≥ 11.00 volts ≤ 32.00 volts = False ≥ 10.00 Nm ≥ 8,192.00 rpm ≥ 0.00 Pct ≤ 0.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 5.00 ratio < 5.50 ratio ≥ 0.20 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 0.20 seconds Once the above fail time is achieved then increment the fail counter once ≥ 5.00 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 ≥ 11.00 volts ≤ 32.00 volts = False ≥ 10.00 Nm ≥ 8,192.00 rpm ≥ 0.00 Pct ≤ 0.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 5.00 ratio < 5.50 ratio ≥ 0.20 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 0.20 seconds Once the above fail time is achieved then increment the fail counter once ≥ 5.00 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 ≥ 11.00 volts ≤ 32.00 volts = False ≥ 10.00 Nm ≥ 8,192.00 rpm ≥ 0.00 Pct ≤ 0.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 5.00 ratio < 5.50 ratio ≥ 0.20 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 0.20 seconds Once the above fail time is achieved then increment the fail counter once ≥ 5.00 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 ≥ 11.00 volts ≤ 32.00 volts = False ≥ 10.00 Nm ≥ 8,192.00 rpm ≥ 0.00 Pct ≤ 0.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 5.00 ratio < 5.50 ratio ≥ 0.20 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 0.20 seconds Once the above fail time is achieved then increment the fail counter once ≥ 5.00 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 ≥ 11.00 volts ≤ 32.00 volts = False ≥ 10.00 Nm ≥ 8,192.00 rpm ≥ 0.00 Pct ≤ 0.00 Pct = TRUE ≥ 5.00 ratio < 5.50 ratio = FALSE ≥ 5.00 ratio < 5.50 ratio ≥ 0.20 seconds TransmissionOutputRotationalStatusValidity EngineTorqueEstInaccurate ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6	≥ 0.20 seconds Once the above fail time is achieved then increment the fail counter once ≥ 5.00 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.
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	> 5 %	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 > 3.4 MPH > **P0806 EngTorqueThreshold Table** (see Supporting Tables) < **P0806 ResidualErrEnableLow Table** (see Supporting Tables) > **P0806 ResidualErrEnableHigh Table** (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

16 OBDG05 ECM Summary Tables (Initial DTCs)

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	< 4 % of Vref 200 counts out of 250 samples	Engine Not Cranking System Voltage	> 11.0 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	> 96 % of Vref 200 counts out of 250 samples	Engine Not Cranking System Voltage	> 11.0 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.
Inlet Airflow System Performance (twin turbo)	P1101	Determines if there are multiple air induction problems affecting airflow and/or manifold pressure.	See table **P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix** for combinations of model failures that can set this DTC. MAF model fails when either MAF1 model fails or MAF2 model fails. MAF1 model fails when ABS(Measured MAF1 Flow – Modeled MAF1 Flow) Filtered MAF2 model fails when ABS(Measured MAF2 Flow – Modeled MAF2 Flow) Filtered MAP1 model fails when ABS(Measured MAP – MAP Model 1) Filtered MAP2 model fails when ABS(Measured MAP – MAP Model 2) Filtered MAP3 model fails when ABS(Measured MAP – MAP Model 3) Filtered TIAP1 model fails when ABS(Measured TIAP – TIAP Model 1) Filtered	> 25.0 grams/sec > 25.0 grams/sec > 25.0 kPa > 25.0 kPa > 25.0 kPa > 30.0 kPa	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. -	>= 425 RPM <= 6,500 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Modeled MAF1 Error multiplied by **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM** and **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on MAF Est** Modeled MAF2 Error multiplied by **P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on MAF Est** and	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.
			TPS model fails when Filtered Throttle Model Error	> 350 kPa*(g/s)		**P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on RPM**		
			TIAP Correlation model fails when High Engine Air Flow is TRUE AND Measured TIAP - measured MAP - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset**	> 30.0 kPa		MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP1 Residual Weight Factor based on RPM**		
			OR			MAP Model 2 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM**		
			Low Engine Air Flow is TRUE AND Measured TIAP - measured Baro - offset as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset**	> 30.0 kPa		MAP Model 3 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM**		
			TIAP Correlation is valid when High Engine Air Flow has been TRUE for a period of time	> 1.5 seconds		TIAP Model 1 Error multiplied by **P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM**		
			OR Low Engine Air Flow has been TRUE for a period of time	> 1.5 seconds		Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM**		
			High Engine Air Flow is		No Active DTCs: -	MAP_SensorCircuitFA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			TRUE when Mass Air Flow	> a threshold in gm sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow**		EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA MnfdTempSensorFA TC_BoostPresSnsrCktFA AmbientAirDefault		
			AND Manifold Pressure	> a threshold in kPa as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP**	No Pending DTCs:	EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP MnfdTempSensorCktFP		
			AND Filtered Mass Air Flow - Mass Air Flow	< 2.0 gm/sec				
			Low Engine Air Flow is TRUE when Mass Air Flow	< a threshold in gm sec as a function of engine speed See table **P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow**				
			AND Manifold Pressure	< a threshold in kPa as a function of engine speed See table				
			-					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			AND Mass Air Flow - Filtered Mass Air Flow	**P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP** < 2.0 gm/sec				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SIDI High Pressure Rail Temperature Sensor Performance	P111F	This DTC Diagnoses Fuel Temperature sensors rationality by comparing Primary sensor (T1) vs. Secondary sensor (T2)	Fuel Temperature Error (Absolute delta between sensor1 and sensor2)	> 10.00 degC	No Fault Active on No Fault Pending on	Fuel Temperature Sensor Equipped SENT Fuel temperature Rationality Diagnostics Enabled Enabled when a code clear is not active or not exiting device control Temperature sensors 1 out of range Low or High Fault Active (P0182, P0182) Temperature sensors 2 out of range Low or High (P0187, P0188) SENT Communication Fault Active (P16E4, P16E5) SENT Intenal Error Fault Active (P126E, P126F) Fuel Temperature Sensor SENT Message Error Fault Active (P128C, P128D) SENT Communication Fault Pending (P16E4, P16E5) Fuel Temperature Sensor SENT Message Error Fault Pending (P128C, P128D)	80.00 failures out of 100.00 samples 100 ms per 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 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 Circuit Board temperature (FP Driver Overtemperature enumeration)	T>= 160 degC (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate)	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] 9V < System V < 32V	3 failures / 15 samples 1 sample / 12.5 millisec	Type B, 2 Trips

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	>= 132 °C >= 2 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.	>= 30 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.
SENT Fuel Rail Temperature Sensor 1 Internal Fault - Error Code	P126E	This DTC Diagnoses the SENT Fuel Temperature Sensor 1 internal failure	Fuel Temperature Sensor 1 SENT digital read value	>= 4,089.00	No Fault Active on No Fault Pending on	Fuel Temperature Sensor Equipped Fuel temperature Error Code DIagnostic Enabled Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (P16E4, P16E5) Fuel Temperature Sensor SENT Message Error Fault Active (P128C) Fuel Temperature Sensor SENT Message Error Fault Pending (P128C)	40.00 failures out of 50.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Temperature Sensor 2 Internal Fault - Error Code	P126F	This DTC Diagnoses the SENT Fuel Temperature Sensor 2 internal failure	Fuel Temperature Sensor 2 SENT digital read value	>= 4,089.00	No Fault Active on No Fault Pending on	Fuel Temperature Sensor Equipped Fuel temperature Error Code DIagnostic Enabled Enabled when a code clear is not active or not exiting device control SENT Communication Fault Active (P16E4, P16E5) Fuel Temperature Sensor SENT Message Error (P128D) Fuel Temperature Sensor SENT Message Error Fault Pending (P128D)	40.00 failures out of 50.00 samples 100 ms per Sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Pressure Sensor 1 Internal Performance	P128A	This DTC diagnoses the internal error within the sensor (i.e. Broken wire bond internal to the SENT Sensor)	Digital pressure sesnor 1 value	>= 4,089	Not Fault Pending	Enabled when a code clear is not active or not exiting device control SENT Fuel Rail Pressure Sensor Internal Performance Enable Dual SENT Pressure Sensor Equipped P16E4 P16E5 P128F	Time Based Mode 420 failures out of 525 samples 6.25 ms per Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Pressure Sensor 2 Internal Performance	P128B	This DTC diagnoses the internal error within the sensor (i.e. Broken wire bond internal to the SENT Sensor)	Digital pressure sesnor 2 value	>= 4,089	Not Fault Pending	Enabled when a code clear is not active or not exiting device control SENT Fuel Rail Pressure Sensor Internal Performance Enable Dual SENT Pressure Sensor Equipped P16E4 P16E5 P128F	Time Based Mode 420 failures out of 525 samples 6.25 ms per Sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Pressure &Temperature Sensor Temperature 1 Message Incorrect	P128C	This DTC diagnoses the the communication errors on the temperature 1 serial data channel						Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Pressure & Temperature Sensor Temperature 2 Message Incorrect	P128D	This DTC diagnoses the the communication errors on the temperature 2 serial data channel						Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Pressure & Temperature Sensor Pressure Message Incorrect	P128F	This DTC diagnoses the SENT signal waveform for discrepancies (i.e. too mny pulse, too few pulse, clock shift)	SENT HWIO Determines message fault (i.e.too mny pulse, too few pulse, clock shift) Message Age	= true > 1.69 ms	 SENT power up delay No Fault Active on	Dual SENT Pressure Sensor Equipped SENT signal waveform Diagnostics Enabled >= 0.00 seconds Enabled when a code clear is not active or not exiting device control P16E4 P16E5	420 failures out of 525 samples 6.5 ms per 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_ChassisFuelPresSysType b) Diagnostic KeFRPR_b_FPPM_RunCrnkRatlEnbld 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 B, 2 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	<> Transmitted Duty Cycle Rolling Count (ECM) (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate test state)	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) 9v < Sys Voltage > 32v	64 failures / 80 samples 1 sample / 12.5 millisec	Type B, 2 Trips
			FPPM Received Duty Cycle Protection Value	<> Transmitted Duty Cycle Protection Value (ECM) (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate test state)	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) 9v < 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) >= 9.0 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	<> ECM Control Status Alive Rolling Count (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate test state)	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 B, 2 Trips
			FPPM Power Consumption Alive Rolling Count	<> ECM Power Consumption Alive Rolling Count (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate test state)	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	<> ECM Driver Status Alive Rolling Count (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate test state)	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 Count	<> ECM Hardware Status Alive Rolling Count (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate test state)	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 (only 1 used): 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	> 5.0 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 (only 1 used): 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	> 5.0 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) > 5.00 KJ/s (low RPM failure mode)	To enable the diagnostic, the Cold Start Emission Reduction Strategy must be Active per the following: Catalyst Temperature AND Engine Coolant AND Engine Coolant AND Barometric Pressure The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following: Catalyst Temperature AND Engine Run Time OR Engine Run Time OR Barometric Pressure	< 350.00 degC > -10.00 degC <= 56.00 degC >= 74.00 KPa >= 900.00 degC >= 18.38 seconds > **P050D_P1400_CatalystLightOffExtendedEngineRunTimeExit** This Extended Engine run time exit is a function of percent ethanol and Catmons NormRatioEWMA. Refer to "Supporting Tables" for details. < 74.00 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	0		
					Vehicle Speed	< 1.24 MPH		
					Allow diagnostic to calculate residual in an off-idle state. If the value of the OffIdleEnable is equal to 1 then the "DriverOffAccelPedal" will not be checked. However, if the value of OffIdleEnable is 0 then driver must be off the accel pedal	0 (A value of 1 allows diagnostic to run and calculate the residual while off idle. A value of 0 requires calculation of the residual at idle)		
					A change in throttle position (tip-in/tip-out) will initiate a delay in the calculation of the average qualified residual value. Therefore when the:			
					Pedal Close Delay Timer	> 5.00 seconds		
					the diagnostic will continue the calculation.			
					A change in gear will initiate a delay in the calculation of the average qualified residual value to			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					allow time for the actual 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 :	> 2.00 seconds > 90.00 % < 15.00 % > 0 These are scalar values that are a function of engine run time. Refer to		

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

Component/ System	Fault Code	Monitor 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 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	Type C, No SVS , special type C

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	Type C, No SVS, special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Set/ Coast Signal 2 Circuit	P155B	Detects a failure of the cruise set 2 switch in a continously applied state	Cruise Control Set 2 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	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Resume/ Acceleration Signal 2 Circuit	P155C	Detects a failure of the cruise resume 2 switch in a continously applied state	Cruise Control Resume 2 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 SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Air Conditioning (A/C) Refrigerant Pressure Too High When A/C Off	P156A	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is stuck or biased in range	**Off Test:** The pressure sensor has to be greater than a threshold value when AC is off (a function of ambient temp) (P156A Off Test Details on Supporting Tables:)	Off Test Pressure > **P156A_Off_Test_Threshold** (function of ambient temperature)	Diagnostic Status Off Test Status AC Off Time No active DTC's	Disabled Disabled Delay Time > **P156A_Off_Test_Delay** Sec. Fault bundles: ACHighSidePressSnsrCktFA ACFailedOnSD ACThrmlRefrigSpdVld ACCMLostComm	80 failures out of 100 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.
Air Conditioning (A/C) Refrigerant Pressure Too Low When A/C On	P156B	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is stuck or biased in range	**On Test:** The pressure sensor has to be less than a threshold value when engaged (a function of ambient temp)	On Test Pressure < **P156B_On_Test_Threshold** (function of ambient temperature) (P156B On Test Details on Supporting Tables:)	Diagnostic Status On Test Status AC On Time No active DTC's	Disabled Disabled Delay Time > 20 Sec. Fault bundles: ACHighSidePressSnsrCktFA ACFailedOnSD ACThrmlRefrigSpdVld ACCMLostComm	80 failures out of 100 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.
Air Conditioning (A/C) Refrigerant Pressure Too High After Soak Time	P156C	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is stuck or biased in range	**Cold Test:** The pressure sensor has to be greater than a threshold value when propulsion system is off for a ambient stabilization time	Cold Test Pressure > **P156C_Cold_Test_Threshold** (function of ambient temperature) (P156C Cold Test Details on Supporting Tables)	Diagnostic Status Cold Test Status AC has been enabled this Trip Enable Timer AC Soak Timer - the soak timer can be established (via calibration enable) to be minimum of the Engine Off Time, and/or the Propulsion System Off Time, and/or the Battery Thermal Conditioning Off Time Difference between Coolant Temperature and Air Temperature No active DTC's	Disabled Disabled FALSE Enabled Time > 1.0 Sec. Minimum Soak Time => 28,800 Sec. Use Engine Off Soak Time = FALSE Use Propulsion Off Soak Time= FALSE Use Battery Off Soak Time = FALSE Temp Diff < 0.0 Deg C Fault bundles: ACHighSidePressSnsrCktFA ACFailedOnSD ACThrmlRefrigSpdVld ACCMLostComm ECT_Sensor_DefaultDetected	80 failures out of 100 samples Report 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.
Internal Control Module SIDI High Pressure Pump current monitor	P163A	This DTC Diagnoses the current from the control area and compares it with calibrated thresholds to set current high and low flags	SIDI fuel pump High Current Test Current SIDI fuel pump Low Current Test Current	 >= 11.00 Amps <= 0.10 Amps	Battery Voltage Low Side Fuel Pressure 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 >= **P0089 - P163A - P228C - P228D - P0191 - 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 3 samples per engine rotaion	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 <= 127		

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: **P1682_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 0.175 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.
SENT Fuel Rail Pressure & Temperature Sensor Communication Circuit 3 Low Voltage	P16E4	This DTC diagnoses the SENT signal shorted low	The number pulses on the SENT signal line SENT Signal Line State	<= 40 = Low	SENT power up delay	Dual SENT Pressure Sensor Equipped SENT Sensor Communication Circuit Low/High Diagnostic Enabled >= 0.00 seconds Enabled when a code clear is not active or not exiting device control	300 failures out of 500 samples 6.5 ms per sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail Pressure & Temperature Sensor Communication Circuit 3 High Voltage	P16E5	This DTC diagnoses the SENT signal shorted High	The number pulses on the SENT signal line SENT Signal Line State	<= 40 = High	SENT power up delay	Dual SENT Pressure Sensor Equipped SENT Sensor Communication Circuit Low/High Diagnostic Enabled >= 0.00 seconds Enabled when a code clear is not active or not exiting device control	300 failures out of 500 samples 6.5 ms per sample Continuous	Type A, 1 Trips

16 OBDG05 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Imbalance	P16E7	Detect a unbalanced Twin Turbo system	Absolut Value (VeBSTR_Pct_TwinBalance)	> 15.00 %	Diagnostic Enabled Engine Speed No DTCs Active: No BSTR Failsoft action active Boost Pressure in Closed Loop	True <= 2,800 rpm MAF_SensorFA	18 Failed tests out of 25 Tests 100ms/ 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 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.	Equivance Ratio torque compensation exceeds threshold	-83.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	Type A, 1 Trips
			Absolute difference between Equivance Ratio torque compensation and its dual store out of bounds given by threshold	83.66 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	83.66 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	67.64 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	15.00 degrees		Engine speed >0rpm	Up/down timer 125 ms continuous, 0.5 down time multipier	
			Torque Learn offset is out of bounds given by threshold range	High Threshold 0.00 Nm Low Threshold 0.00	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.
				Nm				
			One step ahead calculation of air-per-cylinder and two step ahead is greater than threshold	80.00 mg		Engine speed > 550 rpm	Up/down timer 451 ms continuous, 0.5 down time multipier	
			Difference between Unmanaged Spark and PACS Spark is greater than threshold	15.00 degrees	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded Predicted Engine Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Zero pedal axle torque is out of bounds given by threshold range	High Threshold 550.59 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 550.59 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	83.66 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.
			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 < 6,800.00 or 7,000.00 rpm (hysteresis pair)	Up/down timer 151 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.
			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 range	High Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo Low Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo	Ignition State	Accessory, run or crank	255 / 6 counts; 25.0msec/count	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			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 151 ms continuous, 0.5 down time multipier	
			Transfer case neutral request from four wheel drive logic does not match with operating conditions	N/A	Ignition State	Accessory, run or crank Transfer case range valid and not over-ridden FWD Apps only	32 / 400 counts; 25.0msec/count	
			Driver progression mode and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							multipier	
			Predicted torque for uncorrected zero pedal determination is greater than calculated limit.	Table, f(Engine, Oil Temp). **P16F3_Speed Control External Load f(Oil Temp, RPM)** + 83.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine Predicted Request Without Motor is greater than its redundant calculation plus threshold	82.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Engine Immediate Request Without Motor is greater than its redundant calculation plus threshold	82.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							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	83.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Commanded Predicted Engine Request is greater than its redundant calculation plus threshold	83.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, down time	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							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 Immediate Crankshaft Request is less than its redundant calculation minus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Regeneration Brake Assist is not within a specified range	Brake Regen Assist < 0 Nm or Brake Regen Assist > 1,000.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Cylinder Spark Delta Correction exceeds the absolute difference as compared to Unadjusted Cylinder Spark Delta	15.00 degrees	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			1. Cylinder Torque Offset exceeds step size threshold OR	1. 83.66 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.
			2. Sum of Cylinder Torque Offset exceeds sum threshold	2. 83.66 Nm				
			Engine Capacity Minimum Immediate Without Motor is greater than its dual store plus threshold	96.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Engine Capacity Minimum Engine Off is greater than threshold	0 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

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	83.66 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 151 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 151 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: **P16F3_Speed Control External Load f(Oil Temp, RPM)** + 83.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	Table, f(Oil Temp, RPM). See supporting tables: **P16F3_Speed Control External Load f(Oil Temp, RPM)** +	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.
				83.66 Nm				
			Difference between Driver Requested Immediate Torque primary path and its secondary exceeds threshold	550.59 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	550.59 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	550.59 Nm	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.
			OR Commanded Immediate Request is less than its redundant calculation minus threshold				multipier	
			Commanded Immediate Response Type is set to Inactive	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Difference between Cruise Axle Torque Arbitrated Request and Cruise Axle Torque Request exceeds threshold	68.82 Nm		Cruise has been engaged for more than 4.00 seconds	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Desired engine torque request greater than redundant calculation plus threshold	82.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Engine min capacity above threshold	83.66 Nm	Ignition State	Accessory, run or crank	Up/down timer 97 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: **P16F3_Delta Spark Threshold f (RPM,APC)**		Engine speed greater than 0rpm	Up/down timer 125 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 133 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	
			1. Absolute difference of redundant calculated engine speed above threshold	200 RPM		Engine speed greater than 0 RPM	Up/down timer 151 ms continuous, 0.5 down time multipier	
			After throttle blade pressure and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Speed Control's Preditcted Torque Request and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine oil temperature and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 315 ms continuous, 0.5 down time multipier	
			Desired throttle position greater than redundant calculation plus threshold	6.78 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	26.40 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	83.66 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	83.66 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 41.83 Nm Low Threshold -41.83 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	High Threshold	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.
			change is out of allowable range or its dual store copy do not match	78.43 Nm Low Threshold -83.66 Nm Rate of change threshold 5.23 Nm/loop			ms continuous, 0.5 down time multipier	
			Difference of Final Torque feedback proportional plus integral term and its redundant calculation is out of bounds given by threshold range	High Threshold 83.66 Nm Low Threshold - 83.66 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.
			Difference of torque desired throttle area and its redundant calculation is out of bounds given by threshold range	High Threshold 0.50 % Low Threshold - 0.50 %	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of torque model coefficients and its redundant calculation is out of bounds given by threshold range	High Threshold 0.0000372 Low Threshold - 0.0000372	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 83.66 Nm Low Threshold - 83.66 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 83.66 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	High Threshold 83.66	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous,	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			calculation is out of bounds given by threshold range	Nm Low Threshold - 83.66 Nm			0.5 down time multipier	
			Generator friction torque is out of bounds given by threshold range	High Threshold 83.66 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference between the Supercharger friction torque and its redundant calculation greater than threshold	83.66 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 83.66 Nm Low Threshold -83.66 Nm Rate of change threshold 5.23 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 83.66 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 7.95 Nm Low Threshold 2.05 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 OR 4. Reserve engine torque	1. 82.66 Nm 2. N/A 3. 82.66 Nm 4. 82.66 Nm	3. & 4.: Ignition State	1. & 2.: Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 83.66 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.
			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: **P16F3_Delta MAP Threshold f(Desired Engine Torque)**		Engine speed >0rpm	Up/down timer 151 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 is greater than its redundant calculation plus threshold	550.59 Nm	Ignition State	Accessory, run or crank	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.
			OR Driver Predicted Request is less than its redundant calculation minus threshold				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)** + 83.66 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.
			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	
			Difference of minimum spark advance limit and	15.00 degrees	Ignition State	Accessory, run or crank	Up/down timer 151	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			its redundant calculation is out of bounds given by threshold range				ms continuous, 0.5 down time multipier	
			Difference of commanded spark advance and adjusted delivered is out of bounds given by threshold range	15.00 degrees		Engine speed >0rpm	Up/down timer 125 ms continuous, 0.5 down time multipier	
			Absolute difference between Estimated Engine Torque and its dual store are above a threshold	83.66 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference between Estimated Engine Torque without reductions due to torque control and its dual store are above a threshold	83.66 Nm		Engine speed >0rpm	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.
			Difference of desired spark advance for managed torque and its redundant calculation is out of bounds given by threshold range	15.00 degrees		Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 83.66 Nm	Up/down timer 451 ms continuous, 0.5 down time multipier	
			One step ahead calculation of air-per-cylinder greater than two step ahead calculation by threshold for time	Threshold: Dynamically calculated based on current engine conditions Fault Pending Threshold: 100 ms		Engine speed > 550 rpm	Up/down timer 451 ms continuous, 0.5 down time multipier	
			Rate limited cruise axle torque request and its dual store do not match within a threshold	68.82 Nm	Ignition State	Accessory, run or crank	Up/down timer 163 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 Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range OR 2. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its dual store do not equal OR 3. Absolute difference of Calculated accelerator pedal position and its dual store do not equal	1. 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	
			Commanded axle torque is greater than its redundant calculation by	550.59 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous,	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			threshold				0.5 down time multipier	
			Commanded axle torque is less than its redundant calculation by threshold	825.88 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 not equal	N/A	Ignition State	Accessory, run or crank AFM apps only	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			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)	N/A		Engine speed >0rpm	Up/down timer 175	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			calculation does not equal its redundant calculation				ms continuous, 0.5 down time multipier	
			Absolute difference of the calculated spark offset for equivalence ratio and its redundant cacluation is greater than a threshold	15.00 degrees		Engine speed >0rpm	Up/down timer 151 ms continuous, 0.5 down time multipier	
			Transmission Torque Request cacluations do not equal their dual stores	N/A		Run or Crank = TRUE > 0.50 s	16 / 32 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	15 mm2			Up/down timer 133 ms continuous, 0.5	

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

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 ≤ 1.00 Pct ≥ 1.00 Pct	 Ignition voltage Ignition voltage	 ≥ 11.00 volts ≤ 32.00 volts	≥ 0.02 seconds of fail time out of 0.02 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 ≥ 25.00 Pct ≤ 25.00 Pct	Ignition voltage Ignition voltage	≥ 11.00 volts ≤ 32.00 volts	≥ 0.02 seconds of fail time out of 0.02 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 ≤ 1.00 Pct ≥ 1.00 Pct	 Ignition voltage Ignition voltage	 ≥ 11.00 volts ≤ 32.00 volts	≥ 0.02 seconds of fail time out of 0.02 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 ≥ 25.00 Pct ≤ 25.00 Pct	 Ignition voltage Ignition voltage	 ≥ 11.00 volts ≤ 32.00 volts	≥ 0.02 seconds of fail time out of 0.02 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 ≥ 11.00 volts ≤ 32.00 volts	≥ 0.20 seconds Once the above fail time is achieved then increment the fail counter once ≥ 10.00 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 ≥ 11.00 volts ≤ 32.00 volts ≤ 8,192.00 rpm ≤ 0.00 pct ≥ 8,191.88 rpm TransmissionOutputRotationalStatusValidity ClutchPstnSnsr FA ClutchPstnSnsrNotLearned P18C4 P18C5 P18C6 P18C7 P18C8	≥ 0.20 seconds Once the above fail time is achieved then increment the fail counter once ≥ 5.00 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 of fuel consumed by the engine. OR ***************************** Fuel Level is in a Readable Range for both Primary and Secondary Tanks too Long ***************************** This subtest is not used Volume in primary tank is and volume in secondary tank is and remains in this condition for OR ***************************** Fuel consumed without a Secondary Fuel Level Change	≥ 28.7 liters < 2.8 liters 18.5 liters < 29 liters > 3 liters 2,430 seconds	Engine Running No active DTCs: Volume in secondary tank	VehicleSpeedSensor_FA ≥ 2.8 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.
			********** If the vehicle is driven with the fuel consumed by the engine of without the secondary fuel level changing by 3 liters, then the sender must be stuck.	14 liters				

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.
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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type 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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Camshaft Actuator Solenoid Circuit Low – Bank 1	P2090	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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Camshaft Actuator Solenoid Circuit High – Bank 1	P2091	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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type 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 Low– Bank 2	P2092	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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type 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 2	P2093	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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Camshaft Actuator Solenoid Circuit Low – Bank 2	P2094	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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Camshaft Actuator Solenoid Circuit High – Bank 2	P2095	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 ? impedance between signal and controller ground	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type 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 is indicating a rich exhaust gas condition. If the rich condition is such that the control system utilizes all or most of its available low limit authority (low limit = -100% authority), then P2096 will set. The monitor can be calibrated to fail based on the Average Integral Offset % Authority, or based on the Average Integral Offset % Authority AND Average Total Offset % Authority. The Average Total Offset metric consists of the average of the Integral Offset+ Proportional Offset. Note: When the post catalyst O2 voltage is too rich, the post catalyst O2 integral and proportional offset control is decreased (negative % authority). This applies a lean bias to fuel control in an attempt to counteract the rich condition. A perfectly balanced control system (no rich	The Average Integral Offset % Authority AND The Average Total Offset % Authority (Note: any value greater than or equal to +100% effectively nullifies the Average Total Offset % Authority criteria) High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 22 % for >= 5.0 seconds AND the % Authority metric is approaching the failure threshold. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 20 % for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	<= -93.8 % <= -46.1 %	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 for (see "**Long Term Secondary Fuel Trim Enable Criteria**" in Supporting Tables) High Vapor Conditions No Fault Active for:	 Yes Yes Yes Yes Yes >= 70 kPa >= 0.0 g/s <= 10,000.0 >= 10 kPa <= 255 >= -20 deg. C <= 150 >= -20 deg. C (or OBD Coolant Enable Criteria = TRUE) Not Active Not Active >= 0.1 seconds Not Present AmbientAirDefault AIR System FA Ethanol Composition Sensor FA ECT_Sensor_FA EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorFA CamSensorAnyLocationFA EvapEmissionSystem_FA EvapFlowDuringNonPurge_FA	Frequency: Continuous Monitoring in 100ms loop. The Integral and Total Offset % Authority metrics are sampled every 100ms and an average is calculated every 100.0 seconds (1,000 samples) before comparing to their respective failure thresholds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		or lean bias required) is represented by integral and proportional offset values of "0" (i.e. 0% authority) and a post catalyst O2 sensor that is within it's optimal operating range (neither rich nor lean).				FuelTankPressureSnsrCkt_FA 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		
					For the cells identified as enabled (i.e. those containing a "Yes" at the beginning of the Enable Conditions column), the minimum accumulated samples required before the fuel control metric is considered usable for that cell (1 sample = 100ms):			
					Deceleration Idle Cruise Light Acceleration Heavy Acceleration	10,000,000,272,564,200 10,000,000,272,564,200 100 100 100		
					(Note: A value in any of the above operating "cells" that is an order of magnitude (or more) higher than other cells is			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					an indication that the diagnostic is not capable of diagnosing in that cell).			

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 is indicating a lean exhaust gas condition. If the lean condition is such that the control system utilizes all or most of its available high limit authority (high limit = 100% authority), then P2097 will set. The monitor can be calibrated to fail based on the Average Integral Offset % Authority, or based on the Average Integral Offset % Authority AND Average Total Offset % Authority. The Average Total Offset metric consists of the average of the Integral Offset+ Proportional Offset. Note: When the post catalyst O2 voltage is too lean, the post catalyst O2 integral and proportional offset control is increased (positive % authority). This applies a rich bias to fuel control in an attempt to counteract the lean condition. A perfectly balanced control system (no rich	The Average Integral Offset % Authority AND The Average Total Offset % Authority (Note: any value less than or equal to -100% effectively nullifies the Average Total Offset % Authority criteria) High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 22 % for >= 5.0 seconds. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 20 % for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 93.8 % >= 41.4 %	Same as P2096	Same as P2096	Frequency: Continuous Monitoring in 100ms loop. The Integral and Total Offset % Authority metrics are sampled every 100ms and an average is calculated every 100.0 seconds (1,000 samples) before comparing to their respective failure thresholds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		or lean bias required) is represented by integral and proportional offset values of "0" (i.e. 0% authority) and a post catalyst O2 sensor that is within it's optimal operating range (neither rich nor lean).						

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 is indicating a rich exhaust gas condition. If the rich condition is such that the control system utilizes all or most of its available low limit authority (low limit = -100% authority), then P2098 will set. The monitor can be calibrated to fail based on the Average Integral Offset % Authority, or based on the Average Integral Offset % Authority AND Average Total Offset % Authority. The Average Total Offset metric consists of the average of the Integral Offset+ Proportional Offset. Note: When the post catalyst O2 voltage is too rich, the post catalyst O2 integral and proportional offset control is decreased (negative % authority). This applies a lean bias to fuel control in an attempt to counteract the rich condition. A perfectly balanced control system (no rich	The Average Integral Offset % Authority AND The Average Total Offset % Authority (Note: any value greater than or equal to +100% effectively nullifies the Average Total Offset % Authority criteria) High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 22 % for >= 5.0 seconds AND the % Authority metric is approaching the failure threshold. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 20 % for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	<= -93.8 % <= -46.1 %	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 For the cells identified as enabled (i.e. those containing a "Yes" above), the minimum accumulated samples required before the fuel control metric is considered usable for that cell (1 sample = 100ms): Deceleration Idle Cruise Light Acceleration Heavy Acceleration 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).	 Yes Yes Yes Yes Yes 10,000,000,272,564,200 10,000,000,272,564,200 100 100 100	Frequency: Continuous Monitoring in 100ms loop. The Integral and Total Offset % Authority metrics are sampled every 100ms and an average is calculated every 100.0 seconds (1,000 samples) before comparing to their respective failure thresholds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		or lean bias required) is represented by integral and proportional offset values of "0" (i.e. 0% authority) and a post catalyst O2 sensor that is within it's optimal operating range (neither rich nor lean).						

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 is indicating a lean exhaust gas condition. If the lean condition is such that the control system utilizes all or most of its available high limit authority (high limit = 100% authority), then P2099 will set. The monitor can be calibrated to fail based on the Average Integral Offset % Authority, or based on the Average Integral Offset % Authority AND Average Total Offset % Authority. The Average Total Offset metric consists of the average of the Integral Offset+ Proportional Offset. Note: When the post catalyst O2 voltage is too lean, the post catalyst O2 integral and proportional offset control is increased (positive % authority). This applies a rich bias to fuel control in an attempt to counteract the lean condition. A perfectly balanced control system (no rich	The Average Integral Offset % Authority AND The Average Total Offset % Authority (Note: any value less than or equal to -100% effectively nullifies the Average Total Offset % Authority criteria) High Vapor Feature: The diagnostic is at risk of reporting a false fail when excessively High Vapor (HV) conditions are present. This HV condition is indicated when the purge valve is open AND percent vapor is >= 22 % for >= 5.0 seconds. Diagnosis resumes if the purge valve is closed OR the percent vapor is <= 20 % for >= 5.0 seconds. This was done to minimize disabling the diagnostic for longer than necessary.	>= 93.8 % >= 41.4 %	Same as P2098	Same as P2098	Frequency: Continuous Monitoring in 100ms loop. The Integral and Total Offset % Authority metrics are sampled every 100ms and an average is calculated every 100.0 seconds (1,000 samples) before comparing to their respective failure thresholds.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		or lean bias required) is represented by integral and proportional offset values of "0" (i.e. 0% authority) and a post catalyst O2 sensor that is within it's optimal operating range (neither rich nor lean).						

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 >	6.78 percent 6.78 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.
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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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 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 >= 1 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 >= 1 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 >= 1 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 >= 1 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.
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:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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 (see Supporting Table **P219A Variance Threshold Bank1 Table**) and subtracting it from the measured Variance. The result is then divided by a normalizer calibration	1.05 If the diagnostic has reported a failure on the prior trip, the Filtered Ratio must fall below 0.80 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 1.05 .	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	no lower than 11.0 Volts for more than 0.2 seconds > 10.0 percent AND no fuel level sensor fault > -20 deg. C (or OBD Coolant Enable Criteria = TRUE) > 30.0 seconds No 1,100 to 3,500 RPM < 100 RPM 0 to 1,000 g/s < 5 g/s < 0.60 g/s 130 to 500 mg/cylinder < 75 mg/cylinder	Minimum of 1 test per trip, up to 7 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, 13.60 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.
			from another 17 x 17 table (see Supporting Table **P219A Normalizer Bank1 Table**). This quotient is then multiplied by a quality factor calibration from a 17 x 17 table (see Supporting Table **P219A Quality Factor Bank1 Table**). This result is referred to as the Ratio. Note that the quality factor ranges between 0 and 1 and represents robustness to false diagnosis in the current operating region. Regions with low quality factors are not used. Finally, a EWMA filter is applied to the Ratio metric to generate the Filtered Ratio malfunction criteria metric. Generally, a normal system will result in a negative Filtered Ratio while a failing system will result in a positive Filtered 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		Filtered APC delta between samples Note: first order lag filter coefficient applied to APC = 0.250 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 (see Supporting Table **P219A Quality Factor Bank1 Table**). QF values less than “1” indicate that we don’t have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of Variance data. Fuel Control Status Closed Loop and Long Term FT Enabled for:	< 3.50 percent 0 to 70 degrees 0 to 200 percent 0 to 50 degrees 0 to 50 degrees >= 0.99 >= 5.0 seconds (Please see "**Closed Loop Enable Clarification**" and "**Long Term FT Enable Criteria**" in Supporting Tables)	made within 5 minutes of operation. For RSR or FIR, 14 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.
			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.		Device Control AIR pump CASE learn EGR EVAP Engine OverSpeed Protection Idle speed control PTO Injector base pulse width 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:	Not active Not on Not active Not intrusive Not intrusive Not Active Normal Not Active Above min pulse limit = Valid (the O2 heater resistance has learned since NVM reset) >= 0.55 >= 0.65 0.00 0.00 EngineMisfireDetected_FA MAP_SensorFA MAF_SensorFA ECT_Sensor_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						TPS_ThrottleAuthorityDefaulted FuelInjectorCircuit_FA AIR System FA EvapExcessPurgePsbl_FA CamSensorAnyLocationFA FuelTrimSystemB1_FA O2S_Bank_1_Sensor_1_FA O2S_Bank_1_Sensor_2_FA WRAF_Bank_1_FA		

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, while referencing the following Bank2 Supporting Tables: **P219B Variance Threshold Bank2 Table** **P219B Normalizer Bank2 Table** **P219B Quality Factor Bank2 Table** 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.	1.15 If the diagnostic has reported a failure on the prior trip, the Filtered Ratio must fall below 0.92 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 1.15 .	Same as P219A except for the following: Bank1 Fault Active criteria are replaced by the equivalent Bank2 Fault Active criteria. Quality Factor (QF) QF calibrations are located in a 17x17 lookup table versus engine speed and load (Supporting Table **P219B Quality Factor Bank2 Table**). QF values less than “1” indicate that we don’t have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of Variance data. 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 >= 0.55 >= 0.65 0.00 0.00	See P219A 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 (twin turbo)	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	 > 20.0 kPa <= 1.24 miles > 25.0 kPa > 1.24 miles	No Active DTCs:	AmbPresSnsrCktFA IAT_SensorFA MAF_Snsr1_FA AfterThrottlePressureFA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA TC_BoostPresSnsrFA	320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips
			Barometric Pressure OR Barometric Pressure OR ABS(Manifold Pressure - Turbocharger Boost Pressure) AND ABS(Manifold Pressure - Baro Pressure) AND ABS(Manifold Pressure - Baro Pressure 2) AND ABS(Turbocharger Boost Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure 2) AND ABS(Baro Pressure - Baro Pressure2)	< 50.0 kPa > 115.0 kPa <= 10.0 kPa > 10.0 kPa <= 10.0 kPa > 10.0 kPa <= 10.0 kPa > 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 10.0 seconds EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP3_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP3_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Circuit Low (boosted applications, Gen III)	P2228	Detects a continuous short to low in either the signal circuit or the BARO sensor.	BARO Voltage	< 40.0 % of 5 Volt Range (2.0 Volts = 50.9 kPa)			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 (boosted applications, Gen III)	P2229	Detects an open sensor ground, continuous short to high or open in either the signal circuit or the BARO sensor.	BARO Voltage	> 90.0 % of 5 Volt Range (4.5 Volts = 115.0 kPa)			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 Sensor B Circuit Range/ Performance	P222B	Compares baro sensor 2 to the calculated baro estimate	Difference between baro sensor 2 reading and estimated baro when distance since last estimated baro update OR Difference between baro sensor 2 reading and estimated baro when distance since last estimated baro update	 > 20.0 kPa <= 1.24 miles > 25.0 kPa > 1.24 miles	No Active DTCs:	AmbPresSnsr2_CktFA IAT_SensorFA MAF_Snsr2_FA AfterThrottlePressureFA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA TC_BoostPresSnsrFA	320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips
			Barometric Pressure 2 OR Barometric Pressure 2 OR ABS(Manifold Pressure - Turbocharger Boost Pressure) AND ABS(Manifold Pressure - Baro Pressure) AND ABS(Manifold Pressure - Baro Pressure 2) AND ABS(Turbocharger Boost Pressure - Baro Pressure) AND ABS(Turbocharger Boost Pressure - Baro Pressure 2) AND ABS(Baro Pressure - Baro Pressure2)	< 50.0 kPa > 115.0 kPa <= 10.0 kPa <= 10.0 kPa > 10.0 kPa <= 10.0 kPa > 10.0 kPa > 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 10.0 seconds EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP3_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP3_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure Sensor B Circuit Low (Gen III)	P222C	Detects a continuous short to low in either the signal circuit or the BARO sensor B.	BARO Voltage	< 40.0 % of 5 Volt Range (2.0 Volts = 50.9 kPa)			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 Sensor B Circuit High (Gen III)	P222D	Detects an open sensor ground, continuous short to high or open in either the signal circuit or the BARO sensor B.	BARO Voltage	> 90.0 % of 5 Volt Range (4.5 Volts = 115.0 kPa)			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 Sensor B Circuit Intermittent/ Erratic	P222E	Detects a noisy or erratic barometric pressure B input	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current BARO 2 reading - BARO 2 reading from 12.5 milliseconds previous)	> 100 kPa 80 consecutive BARO 2 samples			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.
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 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Bypass Valve - Mechanical Turbocharger with wastegate. Not supercharger with mechanical compressor	P2261	Detect Stuck Closed Bypass Valve	When measuring time accumulated air mass flow derivate boost pressure is high pass filtered with filter frequency A failure is detected when Acc. Filtered Air Mass Flow or Acc.Der.Filtered boost pressure	< 0.650 Second, = 7.20 Hz > 75.00 g/s > 560.00 kPa/s	Diagnostic Enabled Engine Speed Bypass Valve Commanded Open Duty Cycle for at least Pressure ratio over the compressor RelativeLimit Condition keep true for x seconds extra Negative Transient Active: Relative Boost and Pressure derivate Hyst. Negative Transient: Relative Boost or Pressure derivate No Active DTCs:	True >= 1,500 rpm > 6.00 % >= 0.250 s > refer to **P00C4_P2261_KtBSTD_r_SurgeLim** in Supporting Tables 0.80 s >= 15.0 kPa <= -150.0 kPa/s < 5.0 kPa > 50.0 kPa/s BSTR_b_TurboBypassCktFA BSTR_b_BoostSnsrFA MAF_SensorFA	2 Failed tests out of 3 Tests 25ms/ sample	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	< 800 mvolts > 68 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor FA P013A, 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.	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.
					Low Fuel Condition Diag Pedal position Engine Airflow Closed loop integral Closed Loop Active Evap Ethanol Post fuel cell 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)	= False <= 4.0 % 3 <= gps <= 16 0.87 <= C/L Int <= 1.07 = TRUE (Please see "**Closed Loop Enable Clarification**" in Supporting Tables). not in control of purge not in estimate mode = Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info. < 100.0 Nm = not active = not active >= 60.0 sec 500 <= ºC <= 880 = DFCO possible ========== 1,150 <= RPM <= 2,650 1,100 <= RPM <= 2,750		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled) ========== All of the above met for at least 3.0 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	42.3 <= MPH <= 80.2 38.5 <= MPH <= 82.0 0.96 <= EQR <= 1.08 < 18.0 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 > 9.0 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor FA P013A, P013B, P013E, P013F or P2270 > 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.	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.
					Low Fuel Condition Diag Fuel State DTC's Passed ========== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	= False = DFCO possible = P2270 = P013E = P013A ==========		

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	< 800 mvolts > 68 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor FA P013C, 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.	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.
					Low Fuel Condition Diag Pedal position Engine Airflow Closed loop integral Closed Loop Active Evap Ethanol Post fuel cell 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)	= False <= 4.0 % 3 <= gps <= 16 0.87 <= C/L Int <= 1.07 = TRUE (Please see "**Closed Loop Enable Clarification**" in Supporting Tables). not in control of purge not in estimate mode = Enabled, refer to **Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests** for additional info. < 100.0 Nm = not active = not active >= 60.0 sec 500 <= ºC <= 880 = DFCO possible ========== 1,150 <= RPM <= 2,650 1,100 <= RPM <= 2,750		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled) ========== All of the above met for at least 3.0 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	42.3 <= MPH <= 80.2 38.5 <= MPH <= 82.0 0.96 <= EQR <= 1.08 < 18.0 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 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 > 9.0 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA Ethanol Composition Sensor FA P013C, P013D, P014A, P014B or P2272 > 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.	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.
					Low Fuel Condition Diag Fuel State DTC's Passed ========== After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	= False = DFCO possible = P2272 = P014A = P013C ==========		

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	High Pressure Pump Performance Diagnostic Enable >= 11 Volts > 0.275 MPa >= **P0089 - P163A - P228C - P228D - P0191 - 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 3 samples per engine rotaion	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 <= 127		

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		High Pressure Pump Performance Diagnostic Enable	Pressure Error - 750 failures out of 938 samples	Type A, 1 Trips
					Battery Voltage	>= 11 Volts	3 samples per engine rotaion	
					Low Side Fuel Pressure	> 0.275 MPa		
					Engine Run Time	>= **P0089 - P163A - P228C - P228D - P0191 - KtFHPD_t_PumpCntrlEngRunThrsh**		
					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	(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true andManufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active Barometric Pressure Inlet Air Temp Fuel Temp	 >= 70.0 KPA >= -10.0 DegC -10 <= Temp degC <= 127		

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	 > 11.0	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	 > 11.0 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	 > 11.0 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	 > 11.0 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	 > 11.0 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	 > 11.0 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)	 ≤ 100 Ω impedance between signal and controller ground	Engine running Ignition Voltage	 > 11.0 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	 > 11.0 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	 > 11.0 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	 > 11.0 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	 > 11.0 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	 > 11.0 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.
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) 2's complement not equal Torque Request Speed Request OR Rolling count error - Serial Communication message ($1C8) rolling count index value	 Message <> two's complement of message Message <> two's complement of message Message <> previous message rolling count value + one	Diagnostic Status 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 >= 3 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.
Camshaft Position Signal Output Circuit Low	P2615	Diagnoses the Camshaft Position Signal Output 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 Ohms impedance between signal and controller ground Open Circuit: >= 200 K Ohms impedance between signal and controller ground	Powertrain Relay Voltage Engine is not cranking Camshaft Position Output is commanded high	>= 11.0 Volts	40 failures out of 50 samples 1 sample every 100 msec	Type C, No SVS Note: In certain controllers P2614 may also set (Camshaft Position Signal Output Circuit / Open)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Camshaft Position Signal Output Circuit High	P2616	Diagnoses the Camshaft Position Signal Output low side driver circuit for circuit faults	Voltage low during driver on state (indicates short-to-power)	Short to power: <= 0.5 Ohms impedance between signal and controller power	Powertrain Relay Voltage Engine is not cranking Camshaft Position Output is commanded low	>= 11.0 Volts	40 failures out of 50 samples 1 sample every 100 msec	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position Signal Output Circuit Low	P2618	Diagnoses the Crankshaft Position Signal Output 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 Ohms impedance between signal and controller ground Open Circuit: >= 200 K Ohms impedance between signal and controller ground	Powertrain Relay Voltage Engine is not cranking Crankshaft Position Output is commanded high	>= 11.0 Volts	40 failures out of 50 samples 1 sample every 100 msec	Type C, No SVS Note: In certain controllers P2617 may also set (Crankshaft Position Signal Output Circuit / Open)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position Signal Output Circuit High	P2619	Diagnoses the Crankshaft Position Signal Output low side driver circuit for circuit faults	Voltage low during driver on state (indicates short-to-power)	Short to power: <= 0.5 Ohms impedance between signal and controller power	Powertrain Relay Voltage Engine is not cranking Crankshaft Position Output is commanded low	>= 11.0 Volts	40 failures out of 50 samples 1 sample every 100 msec	Type C, No SVS

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 > 0.25 %.			Count Up Test: 4 failures out of 20 samples 1 sec / sample Continuous while run/crank is not active and until controller shutdown is initiated. Range Test: Once per trip when controller shutdown is initiated or run/ crank becomes active.	Type B, 2 Trips

Component/ System	Fault Code	Monitor 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 (see Supporting Calibration tab) OR >= High Threshold (see Supporting Calibration tab) (tabulated result: function of desired fuel rail pressure and fuel flow rate)	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	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 ≥ 11.00 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 ≥ 11.00 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.
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: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds CAN hardware is bus OFF for	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 0 (1 indicates enabled) = Active > 11.00 Volts > 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	To detect that a fault has caused the CAN serial data expansion bus to the Off state	Bus Status	Off	Ignition circuit input state	High (Run or Crank)	5 failures / 5 samples 1 sample / 12.5 millisec	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		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
					U0073	Not Active on Current Key Cycle		
			Message $0BD	≥ 12.0 seconds	Normal CAN transmission on Bus A	Enabled		
			Message $0C7	≥ 12.0 seconds	Device Control	Not Active		
			Message $0F9	≥ 12.0 seconds	High Voltage Virtual Network Management	Not Active		
			Message $189	≥ 12.0 seconds	Ignition Voltage Criteria:			
			Message $199	≥ 12.0 seconds	Run/Crank Ignition voltage	> 6.41 Volts		
			Message $19D	≥ 12.0 seconds				
			Message $1AF	≥ 12.0 seconds	Power Mode	= run		
			Message $1F5	≥ 12.0 seconds	Off Cycle Enable Criteria:			
			Message $4C9	≥ 12.0 seconds	KeCAND_b_OffKeyCycle DiagEnbl	= 0 (1 indicates enabled)		
					Ignition Accessory Line and Battery Voltage	= Active > 11.00 Volts		
					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			

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 Cruise Control Module	U0104	This DTC monitors for a loss of communication with the Cruise Control Module.	Message is not received from controller for Message $2CB Message $2CD	 ≥ 12.0 seconds ≥ 12.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 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 > 6.41 Volts = run = 0 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Network Management is not active for U0104 Cruise 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 Body Control Module	U0140	This DTC monitors for a loss of communication with the Body Control Module.	Message is not received from controller for Message $0F1 Message $12A Message $1E1 Message $1F1 Message $1F3 Message $3C9 Message $3CB Message $3F1 Message $451 Message $4D7 Message $4E1 Message $4E9	 ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 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 > 6.41 Volts = run = 0 (1 indicates enabled) = Active > 11.00 Volts > 0.4000 seconds	Diagnostic runs in 12.5 ms loop	Type C, No SVS "Special Type C"

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					U0140 Body Control Module	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	 ≥ 12.0 seconds ≥ 12.0 seconds	General Enable Criteria: U0074 Normal CAN transmission on Bus B Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 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 > 6.41 Volts = run = 0 (1 indicates enabled) =Active > 11.00 Volts > 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		

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	Timer - Fuel System Control message CAN $0D9 not received (FPPM Received Serial Data Communication Status)	t > 10 s (Fu Pmp Pwr Mod smart device reports Faulted, Not Faulted or Indeterminate)	a) FPPM configuration KeFRPR_e_ChassisFuel PresSysType 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) 9v < Sys Voltage > 32v	64 failures / 80 samples 1 sample / 12.5 millisec	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Heater Coolant Pump Control Circuit Open	B269A	Diagnoses the Heater Coolant Pump 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 Ignition in Range Engine not cranking Run Crank active == Above is true and == Last Open Circuit Test	 = True = True = True ========== not Indeterminate	5 failures out of 10 samples 1 sec/ sample Continuous	Type B, 2 Trips Note: In certian controllers B269C may also set

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Heater Coolant Pump Control Circuit Low	B269C	Diagnoses the Heater Coolant Pump 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 Ignition in Range Engine not cranking Run Crank active == Above is true and == Last Ground Short Circuit Test	 = True = True = True ========== not Indeterminate	5 failures out of 10 samples 1 sec/ sample Continuous	Type B, 2 Trips Note: In certian controllers B269A may also set

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Heater Coolant Pump Control Circuit High	B269D	Diagnoses the Heater Coolant Pump 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 Ignition in Range Engine not cranking Run Crank active == Above is true and == Last Power Short Circuit Test	 = True = True = True ========== not Indeterminate	5 failures out of 10 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.
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 Sensor A (mid-park phaser)	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 -6.9 crank degrees before or 12.8 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	 CrankSensor_FA P0340, P0341 < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. After the first failed test, there is a delay until the camshaft phaser control logic verifies and reports that the camshaft is actually parked. One sample per cam rotation	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 2 Sensor A (mid-park phaser)	P0018	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 2 sensor A occurs during the incorrect crank position	2 cam sensor pulses more than -6.9 crank degrees before or 12.8 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	 CrankSensor_FA P0345, P0346 < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. After the first failed test, there is a delay until the camshaft phaser control logic verifies and reports that the camshaft is actually parked. One sample per cam rotation	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 Circuit Performance (OAT wired to ECM)	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 deg C < 15.0 deg C VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_DefaultDetected MAF_SensorFA EngineModeNotRunTimerError	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		EngineModeNotRunTimerError		

16 OBDG05 ECM Summary Tables (Unique 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

16 OBDG05 ECM Summary Tables (Unique 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 deg C 10 consecutive OAT 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.
Intake Air Temperature Sensor 2 Circuit Performance (applications with humidity sensor, but no IAT3 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)	> 10 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 >= 11.0 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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Pressure Measurement System - Multiple Sensor Correlation (naturally aspirated with TIAP/ Baro sensor)	P00C7	Detects an inconsistency between pressure sensors in the induction system in which a particular sensor cannot be identified as the failed sensor	ABS(Manifold Pressure - Baro Pressure)	> 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating Manifold Pressure Manifold Pressure Baro Pressure Baro Pressure No Active DTCs: No Pending DTCs:	 > 409.6 seconds >= 50.0 kPa <= 115.0 kPa >= 50.0 kPa <= 115.0 kPa EngineModeNotRunTimer Error MAP_SensorFA AAP_SnsrFA MAP_SensorCircuitFP AAP_SnsrCktFP	4 failures out of 5 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.
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	<= 150 kPa*(g/s) > 9.0 grams/sec > 10.0 kPa	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. -	>= 300 RPM <= 6,800 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** Modeled Air Flow Error multiplied by **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM** and **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on MAF Est** MAP Model 2 Error multiplied by	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.
						P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM		
					No Active DTCs: No Pending DTCs:	MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA 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.
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	<= 150 kPa*(g/s) > 20.0 kPa > 10.0 kPa	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. No Active DTCs:	>= 300 RPM <= 6,800 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** MAP Model 1 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP1 Residual Weight Factor based on RPM** MAP Model 2 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA	Continuous Calculations 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.
						ECT_Sensor_FA IAT_SensorFA		
					No Pending DTCs:	EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP		
			Manifold Pressure OR Manifold Pressure	< 50.0 kPa > 115.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating	> 409.6 seconds	4 failures out of 5 samples 1 sample every 12.5 msec	
					No Active DTCs:	EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA		
					No Pending DTCs:	MAP_SensorCircuitFP AAP_SnsrCktFP		

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 IAT3 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)	> 10 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 >= 11.0 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

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	> 150 kPa*(g/s) > 9.0 grams/sec <= 10.0 kPa	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. No Active DTCs:	>= 300 RPM <= 6,800 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** Modeled Air Flow Error multiplied by **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM** and **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on MAF Est** MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA	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:	CrankSensor_FA ECT_Sensor_FA 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.
Crankshaft Position Sensor - Crankshaft Start Position Incorrect	P034A	Monitors the position of the crankshaft during a hybrid auto-start to verify that the sensor has reported the crankshaft position properly.	Crankshaft position is in error by a number of crankshaft wheel teeth	> 1 crankshaft teeth	Engine has started rotating during a hybrid auto-start Crankshaft position is being verified No Active DTCs:	CrankSensor_FA	1 failures out of 3 samples a sample occurs each time the engine is started	Type B, 2 Trips
			Crankshaft position is in error by at least one crankshaft wheel tooth		Engine has started rotating during a hybrid auto-start Crankshaft position is being verified No Active DTCs:	CrankSensor_FA	4 failures out of 5 samples a sample occurs each time the engine is started	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position Sensor - Crankshaft Direction Incorrect	P034B	The Crankshaft Direction Incorrect test monitors the number of crankshaft reversals reported by a bi-directional crank sensor.	Number of crankshaft sensor reversals within a period of time	>= 3 <= 10.0 seconds	Engine Speed Engine Speed Engine Air Flow Engine Movement Detected No Active DTCs:	> 400 RPM < 2,000 RPM >= 3.0 grams/second CrankSensor_FA	Continuous 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.
Evaporative Emission (EVAP) System Small Leak Detected (No ELCP - Conventional EVAP Diagnostic with EAT 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.	> 0.57 (EWMA Fail Threshold), ≤ 0.35 (EWMA Re-Pass Threshold)	Fuel Level Drive Time Drive length (ECT OR OBD Coolant Enable Criteria 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	10 % ≤ Percent ≤ 90 % ≥ 600 seconds ≥ 3.1 miles ≥ 63 °C = TRUE) ≥ 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 conditions 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) Pa from peak pressure, the vent is then opened for 60 seconds to normalize the system pressure. The vent is again closed to begin the vacuum portion of the test (phase-2). As the fuel temperature continues to fall, a vacuum will begin forming. The vacuum will continue until it reaches a vacuum peak. When the pressure rises 62 Pa from vacuum peak, the test then completes. If the key is turned on while the diagnostic test is in progress, the test will abort.			Valid ********** 1. Startup OAT is less than previous trip EAT OR 2. Startup ECT - previous trip EAT OR 3. Engine off time OR 4. At startup, time since previous EAT valid and able to learn OR 5. EAT - current OAT OR 6. EAT < current OAT and speed timer and current OAT - EAT Speed timer increments at 100 msec rate and increments vary based on vehicle speed as follows: vehicle speed < 19 mph 19 mph<speed< 53 mph 53 mph<speed< 124 124 mph<speed< 124 Speed timer can never be less than 0 seconds ********** 1. High Fuel Volatility During the volatility	********** ≤ 0 °C ≥ 7,200 seconds ≤ 3,600 seconds 0 °C ≤ difference ≤ 2 °C ≥ 260 seconds ≤ 2 °C - 10.0 seconds 0.13 seconds 0.25 seconds 1.00 seconds ********** 		

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					OR 5. Vacuum Out of Range and Refueling Detected See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for information on fuel level refueling. OR 6. Vent Valve Override Failed Device control using an off-board tool to control the vent solenoid, cannot exceed during the EONV test OR 7. Key up during EONV test	0.50 seconds		
					No active DTCs:	MAF_SensorFA ECT_Sensor_FA IAT_SensorFA VehicleSpeedSensor_FA IgnitionOffTimeValid AmbientAirDefault		
					No Active DTC's TFTKO	P0443 P0446 P0449 P0452 P0453 P0455 P0458 P0459 P0498		

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						P0499 P0496		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Assist Vacuum Too Low	P050F	Monitors for a brake booster vacuum leak	Brake booster vacuum drift ratio (EWMA) reaches the fail threshold (based on engine running condition) before the sample count threshold is reached, a failure is reported. Engine Running Fail Threshold Diagnostic failed prior loop Diagnostic passed prior loop Before the sample counts Engine Stopped Fail Threshold Diagnostic failed prior loop Diagnostic passed prior loop Before the sample counts	 >= 0.60 >= 0.65 > 0.00 counts >= 0.80 >= 0.90 > 0.00 counts	Diagnostic is enabled and the following conditions are met for engine run conditions: No brake booster vacuum sensor faults active No brake pedal position sensor faults active Brake pedal travel is No mass air flow faults No manifold air pressure faults Mass air flow delta Manifold air pressure Engine vacuum stability time has reached Difference between brake booster vacuum and manifold air pressure is OR Diagnostic is enabled for the following engine auto off conditions: No brake booster vacuum sensor faults active	Enabled < 8.00 percent - 5.00 percent offset >= 6.00 grams / second <= 20.00 kPa >= 0.70 seconds > 10.00 kPa Enabled	Performed every 100 msecond Minimum time to pass: Engine Running 0.00 second Engine Stopped 0.00 second	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No brake pedal position sensor faults active			
					Brake pedal travel is	< 8.00 percent - 5.00 percent offset		
					No engine movement detected			
					Engine is in AutoStop mode			
					OR			
					Diagnostic is enabled for the following key off conditions:	Disabled		
					No brake booster vacuum sensor faults active			
					No brake pedal position sensor faults active			
					Brake pedal travel is	< 8.00 percent - 5.00 percent offset		
					No engine movement detected			
					Engine is in KeyStop mode			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Oil Pressure (EOP) Sensor Performance - Two Stage Oil Pump	P0521	Determines if the Engine Oil Pressure (EOP) Sensor is stuck or biased in range	**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 Engine Oil Pressure above expected threshold <u>To pass when previously failing:</u> Filtered Engine Oil Pressure above low threshold plus an offset OR	 Filtered Oil Pressure < **P0521_LowMinOilPresFail - Two Stage Oil Pump** OR Filtered Oil Pressure > (**P0521_P06DD_P06DE_OP_HiStatePressure** * 1.25 + 75.0 kPa) Filtered Oil Pressure > (20.0 kPa+ **P0521_LowMinOilPresFail - Two Stage Oil Pump**) OR	Two Stage Oil Pump is Present = TRUE Engine Running Diagnostic Status Engine Off Rationality Test Diagnostic Reporting Status Oil Pressure Sensor In Use Engine Running Ambient Air Pressure Oil Aeration (= TRUE if engine speed > 10,000 RPM for longer than 30.0 seconds) Filtered Engine Speed within range Modelled Oil Temperature within range No active DTC's	TRUE Enabled Test not report a fail state Yes ≥ 10.0 seconds ≥ 70.0 kPa FALSE 1,000 RPM ≤ Filtered Engine Speed ≤ 4,500 RPM 40.0 deg C ≤ Oil Temp ≤ 120.0 deg C Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA CrankSensor_FA	 ≥ 40 errors out of 50 samples. Performed every 100 msec ≥ 10 passes out of 50 samples. Performed every 100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Filtered Engine Oil Pressure below high threshold minus an offset	Filtered Oil Pressure < (**P0521_P06DD_P06DE_OP_HiStatePressure** * 1.25 + 75.0 kPa) - 20.0 kPa (Details on Supporting Tables Tab: **P0521_LowMinOilPresFail - Two Stage Oil Pump P0521_P06DD_P06DE_OP_HiStatePressure**)				
			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 ≥ 48.0 kPa	Two Stage Oil Pump is Present = TRUE Engine Off Rationality Test Diagnostic Status Engine Running Rationality Test Diagnostic Status Modelled Oil Temperature No Engine Movement No active DTC's	TRUE Enabled Test not report a fail state ≥ 70.0 deg C > 10.0 seconds EngineModeNotRunTimer_FA EngOilTempFA EngOilPressureSensorCktFA CrankSensor_FA	≥ 20 errors out of 40 samples. Run once per trip	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Air Conditioning High Side Pressure Sensor (HSPS) Sensor Performance	P0531	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is stuck or biased in range	**Engaged Test** <u>Primary Enable Conditons:</u>		Compressor Type = Electric Driven Diagnostic Status Engaged Test Status Enable with Key Off No active DTC's	Electronic Varaible Disabled Disabled Disabled Fault bundles: ACHighSidePressSnsrCktFA ACFailedOnSD ACThrmlRefrigSpdVld ACCMLostComm		Type X, No MIL
			<u>To fail a currently passing Engaged test:</u> The filtered, weighted ratio between measured Delta and predicted delta (a function of ambient temp, coolant temp, vehicle speed, and fan speed.):	Measured Test Delta Pressure ÷ Predicted Engaged Test Filtered Weighted Pressure) * first order filter coefficient < 0.0000 Predicted Engaged Test Filtered Weighted Pressure = (**P0531_Coolant_Weighting_Factor** * **P0531_FanSpeed_Weighting_Factor** * **P0531_Delta_Predicted_ Pressure** * **P0531_Delta_Predicted_Quality_Factor**) with a 1st order filter coefficient =	Use First Order Filter = FALSE 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 values: 0.00	Compressor Speed > 0 RPM **P0531_Delta_Predicted_Quality_Factor** > 0.0 and **P0531_Coolant_Weighting_Factor** > - 0.0 AND < 16.0 and **P0531_FanSpeed_Weighting_Factor** > - 0.0 AND < 16.0	Performed every 100 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				(P0531 Engage Test Details on Supporting Tables Tab: **P0531_Coolant_Weighting_Factor** **P0531_FanSpeed_Weighting_Factor** **P0531_Delta_Predicted_ Pressure** **P0531_Delta_Predicted_Quality_Factor**)	Fast Initial Response (FIR): FIR will trigger when an NVM reset or code clear occurs. Once triggered, the filtered ratio is reset to Initial response test ratio: FIR Test Ratio = 0.00 with an initial response first order filter: FIR Test Filter = 0.00 Rapid Step Response (RSR): RSR will trigger if the ratio result from the last test is < 0.00 AND the delta from the last filtered ratio by > 0.00 Once triggered, the RSR filtered ratio is reset to: RSR Test Ratio = 0.00 with an rapid step response first order filter: RSR Test Filter = 0.00		0 FIR tests must complete before the diagnostic can report. 0 RSR tests must complete before the diagnostic can report.	
			<u>To pass a currently failing Engaged test:</u> The filtered, weighted ratio between measured delta and predicted delta (a function of ambient temp, coolant temp,	Measured Test Delta Pressure / Predicted Engaged Test: Filtered Weighted Pressure) * first order	Use First Order Filter = FALSE Quality or weighting factor values less than “1” indicate that we don’t	Compressor Speed > 0 RPM **P0531_Delta_Predicted_Quality_Factor** > 0.0	Performed every 100 msec # of Test Samples = 100	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			vehicle speed and fan speed.):	filter coefficient => 0.0000 Predicted Engaged Test Filtered Weighted Pressure = (**P0531_Coolant_Weighting_Factor** * **P0531_FanSpeed_Weighting_Factor** * **P0531_Delta_Predicted_ Pressure** * **P0531_Delta_Predicted_Quality_Factor**) with a first order filter coefficient = 0.00 (P0531 Engage Test Details on Supporting Tables Tab: **P0531_Coolant_Weighting_Factor** **P0531_FanSpeed_Weighting_Factor** **P0531_Delta_Predicted_ Pressure** **P0531_Delta_Predicted_Quality_Factor**)	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 values: Fast Initial Response (FIR): FIR will trigger when an NVM reset or code clear occurs. Once triggered, the filtered ratio is reset to Initial response test ratio: FIR Test Ratio = 0.00 with an initial response first order filter: FIR Test Filter = 0.00 Rapid Step Response (RSR): RSR will trigger if the ratio result from the last test is < 0.00 AND	and **P0531_Coolant_Weighting_Factor** > - 0.0 AND < 16.0 and **P0531_FanSpeed_Weighting_Factor** > - 0.0 AND < 16.0	0 FIR tests must complete before the diagnostic can report. 0 RSR 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.
					the delta from the last filtered ratio by > 0.00 Once triggered, the RSR filtered ratio is reset to: RSR Test Ratio = 0.00 with an rapid step response first order filter: RSR Test Filter = 0.00			

16 OBDG05 ECM Summary Tables (Unique DTCs)

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) *100	< 3 percent	AC HSP Sensor Present Diagnostic Status	Yes Enabled	120 failures out of 100 samples Performed every 25 msec	Type A, 1 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

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) *100	> 95 percent	AC HSP Sensor Present Diagnostic Status	Yes Enabled	120 failures out of 100 samples Performed every 25 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Booster Pressure Sensor Performance	P0556	Determines if the Brake Booster Vacuum Sensor is stuck or skewed within the normal operating range by comparing the engine vacuum to the brake booster vacuum when the engine is producing a large amount of vacuum	Engine vs brake booster vacuum sensor values are compared when % throttle < value for a time period. When throttle once again > calibrated value, min and max vacuum sensor values are normalized and subtracted from a 1st order lag filter value of 1. A properly operating vacuum sensor would have a normalized result of 1 or greater. If the normalized result is greater than 1 it is considered 1. The 1st order lag filter value would be 0 in a passing system. 1st order lag fail threshold 1st order lag re-pass threshold	 > 0.20 < 0.7	Throttle Area (with idle included) for time period of BrkBoostVacDiff For time period of AND Vacuum Delta Diagnostic enabled/ disabled No active DTC's	<= 5.0 Percent for > 3.0 seconds > 0.3 kPa >= 0.2 Seconds >= 6.0 kPa Enabled Fault bundles: MAP_SensorFA TPS_FA BrakeBoosterSensorCktFA	Pass counter incremented when enable conditions are met, pass achieved when counter >= 7 Performed every 100 msec	Type X, No MIL

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Booster Pressure Sensor Circuit Low Voltage	P0557	Determines if the Brake Booster Pressure Sensor circuit voltage is too low	(Brake Booster Pressure Sensor Voltage) ÷ 5 Volts *100	< 5.00 percent	Brake booster diagnostic enabled/disabled Brake booster pressure sensor present	Enabled Present	320 failures out of 400 samples 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.
Brake Booster Pressure Sensor Circuit High Voltage	P0558	Determines if the Brake Booster Pressure Sensor circuit voltage is too high	(Brake Booster Pressure Sensor Voltage) ÷ 5 Volts *100	> 95.00 percent	Brake booster diagnostic enabled/disabled Brake booster pressure sensor present	Enabled Present	2,000 failures out of 2,400 samples 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.
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** P057B as a function of calculated brake pedal position delta EWMA value is > 0.80	calculated brake pedal position delta sample counter > 50.00 for fast test OR calculated brake pedal position delta sample counter > 1,000.00 for slow test	calculated brake pedal position delta > 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** P057B as a function of calculated brake pedal position delta EWMA value is less thatn 0.40	no DTC's active (P057C, P057D)	shift lever has been in park once this key cycle vehicle speed >= 5.00 accelerator pedal position < 5.00	total number of EWMA tests > 2.00	

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

16 OBDG05 ECM Summary Tables (Unique 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.
Brake Pedal Position Sensor Circuit Intermittent/ Erratic	P057E	detects noisy / erratic ouput for brake pedal position sensor	If x of y samples are observed above failure threshold, default brake pedal position to zero percent and set DTC	25.00	Brake Pedal Position Sensor Circuit Intermittent / Erratic Diagnostic Enable	1.00	10.00 / 16.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Performance	P058A	This DTC monitors for a battery module internal fault	Battery Module signals an internal fault via LIN bus VeVITR_e_IBS_InternalFault	= CeVITR_e_DiagFailed	The diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature	= 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius	Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Temperature Monitoring Performance	P058C	This DTC monitors for a battery module temperature fault	Difference between Battery Module raw temperature values	> 10.00 Celsius	The historical mode diagnostic is enabled and / or The continuous mode diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature For Historical Mode IBS Down Counter (over LIN bus) For Continuous Mode IBS Down Counter (over LIN bus) IBS Temperature Data Available over LIN bus Internal Temperature Circuit Low Fault Active (P16DE) Internal Temperature Circuit High Fault Active (P16DF)	= 1 (1 indicates enabled) = 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius Between 1 and 24 = zero = True = False = False	8 failed samples within 10 total samples Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Battery Module Temperature Too High Fault Active (P058E) Battery Module Temperature Too Low Fault Active (P058F)	= False = False		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Temperature Too High	P058E	This DTC monitors for a battery module temperature too high fault	Battery Module raw temperature 2 value	> 120.00 Celsius	The historical mode diagnostic is enabled and / or The continuous mode diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature For Historical Mode IBS Down Counter (over LIN bus) For Continuous Mode IBS Down Counter (over LIN bus) IBS Measure Temperature Data Available over LIN bus	= 1 (1 indicates enabled) = 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius Between 1 and 24 = zero = True	4 failed samples within 5 total samples Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Temperature Too Low	P058F	This DTC monitors for a battery module temperature too low fault	Battery Module raw temperature 2 value	< -43.00 Celsius	The historical mode diagnostic is enabled and / or The continuous mode diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature For Historical Mode IBS Down Counter (over LIN bus) For Continuous Mode IBS Down Counter (over LIN bus) IBS Measure Temperature Data Available over LIN bus	= 1 (1 indicates enabled) = 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius Between 1 and 24 = zero = True	4 failed samples within 5 total samples Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Active Grill Air Shutter A Performance /Stuck OFF	P059F	Compare commanded shutter A position to sensed position	Consecutive failed intrusive position performance test count	>= 5.00	1. Ignition Run_Crack Active, 2. Ignition Run_Crank AND Ignition Accessory AND ECU Awake, 3. Command Shutter1 Enable	1. = TRUE, 2. = FALSE AND = FALSE AND = TRUE, 3. = TRUE	1 sample / 100 millisec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Relay Control Circuit Open	P0627	Diagnoses the fuel pump relay control high side driver circuit for circuit faults	Voltage high during driver off state (indicates open circuit)	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Run/Crank Voltage Engine Speed	Voltage ≥ 11.00 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0629 may also set (Fuel Pump Relay Control Short to Power)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Relay Control Circuit High Voltage	P0629	Diagnoses the fuel pump relay control high side driver circuit for circuit faults	Voltage high during driver off state (indicates short to power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Run/Crank Voltage Engine Speed	Voltage ≥ 11.00 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0627 may also set (Fuel Pump Relay Control Open Circuit)

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Shared High Side Drive #1 Control Circuit Low (STG) - (GEN III Controllers ONLY)	P0658	Diagnoses shared high side driver circuit low voltage	Shared high side drive #1 control circuit low voltage	Controller internal diagnostic	Shared high side drive #1 low diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 0.00 >= 11.00 > 5.00 = ON	20 failures out of 25 samples 100 ms / sample	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Shared High Side Drive #1 Control Circuit High (STP) - (GEN III Controllers ONLY)	P0659	Diagnoses shared high side driver circuit low voltage	Shared high side drive #1 control circuit low voltage	Controller internal diagnostic	Shared high side drive #1 diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 0.00 >= 11.00 > 5.00 = ON	20 failures out of 25 samples 100 ms / sample	Type X, No MIL

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Control Module (FPCM) Requested MIL Illumination	P069E	Monitors the FPCM MIL request line to determine when the FPCM has detected a MIL illuminating fault.	Fuel Pump Control Module 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.
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 Status Powertrain Relay Voltage Run/Crank Active Cranking State	Enabled ≥ 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type A, 1 Trips Note: In certain controllers P06DB may also set (Two Stage Oil Pump Control Circuit Short To Ground)

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 Status Powertrain Relay Voltage Run/Crank Active Cranking State	Enabled ≥ 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type A, 1 Trips Note: In certain controllers P06DA may also set (Two Stage Oil Pump Control Circuit Open)

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 Status Powertrain Relay Voltage Run/Crank Active Cranking State	Enabled ≥ 11.00 = True = False	>= 40 errors out of 50 samples. Performed every 100 msec	Type A, 1 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 - Two Sided	P06DD	Diagnoses the two stage oil pump is stuck in the high pressure state	<u>Fail from passing state:</u> 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 1.5 seconds] Oil Pressure delta < **P06DD_P06DE_OP_StateChangeMin** AND Filtered Oil Pressure ≥ (**P0521_P06DD_P06DE_OP_HiStatePressure** + **P06DD_P06DE_OP_LoStatePressure**) ÷ 2 (see P06DD details on Supporting Tables Tab **P06DD_P06DE_OP_StateChangeMin** **P0521_P06DD_P06DE_OP_HiStatePressure** **P06DD_P06DE_OP_LoStatePressure**)	<u>Common Criteria:</u> Two Stage Oil Pump is Present Engine Running Ambient Air Pressure Oil Aeration (= TRUE if engine speed > 10,000 RPM for longer than 30.0 seconds) No active DTC's for diagnsotic enable: Check oil pump TFTKO as a diagnostic enable when Enabled. No active DTC's for control enable: <u>Active Criteria:</u> One Sided Performance Test = Disabled	TRUE ≥ 10.0 seconds ≥ 70.0 kPa FALSE Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA CrankSensor_FA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA OilPmpTFTKO Enabled : OilPmpTFTKO Enabled Fault bundles for control disable : OilPmpTFTKO EngineTorqueEstInaccurate EngOilPressureSensorFA PowertrainRelayFault CrankSensor_FA EngOilTempFA Disabled	≥ 12 errors out of 15 samples. Run once per trip or activiated by the Passive Test	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Oil Pump in Low State	> 1.5 seconds		
					Modelled Oil Temperature within range	-7.0 deg C ≤ Oil Temp ≤ 120.0 deg C		
					Filtered Engine Speed within range	1,500 RPM ≤ Filtered Engine Speed ≤ 2,500 RPM		
					Delta Filtered Engine Speed within a range	ABS [Filtered RPM at beginning of State change - Filtered RPM after 1.0 seconds] ≤ 50 RPM		
					Engine Torque within range	**P06DD_P06DE_MinEnableTorque_OP** ≤ Indicated Requested Engine Torque ≤ **P06DD_P06DE_MaxEnableTorque_OP** (see P06DD details on Supporting Tables Tab **P06DD_P06DE_MinEnableTorque_OP** **P06DD_P06DE_MaxEnableTorque_OP**)		
					Filtered Oil Pressure within range	Filtered Engine Oil Pressure > **P06DD_P06DE_MinOilPressThresh** (see P06DD details on Supporting Tables Tab **P06DD_P06DE_MinOilPressThresh**)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Expected Oil Pressure Delta within range	25.0 kPa < ABS [**P0521_P06DD_P06DE_OP_HiStatePressure** - **P06DD_P06DE_OP_LoStatePressure**] < 215.0 kPa		
					Passive Criteria:			
					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 1.00 seconds] ≤ 1,000 RPM		
					Oil Pressure Delta within a range	Oil Pressure Delta < **P06DD_P06DE_OP_StateChangeMin** (see P06DD details on Supporting Tables Tab **P06DD_P06DE_OP_StateChangeMin**)		
			Fast Pass Condition Oil Pressure delta is less than a minimum delta pressure on a state change and the measured filtered oil pressure is	Oil Pressure delta = ABS [Filtered Oil Pressure at beginning of state change -	Common Criteria: Two Stage Oil Pump is Present Engine Running	 TRUE ≥ 10.0 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.
			above a threshold	filtered oil pressure after 1.5 seconds] Oil Pressure delta < **P06DD_P06DE_OP_StateChangeMin** AND Filtered Oil Pressure ≥ (**P0521_P06DD_P06DE_OP_HiStatePressure** - **P06DD_P06DE_OP_LoStatePressure**) ÷ 2 (see P06DD details on Supporting Tables Tab **P06DD_P06DE_OP_StateChangeMin** **P0521_P06DD_P06DE_OP_HiStatePressure** **P06DD_P06DE_OP_LoStatePressure**)	Ambient Air Pressure Oil Aeration (= TRUE if engine speed > 10,000 RPM for longer than 30.0 seconds) No active DTC's for diagnsotic enable: Check oil pump TFTKO as a diagnostic enable when Enabled. No active DTC's for control enable: <u>Active Criteria:</u> One Sided Performance Test = Disabled Oil Pump in Low State Modelled Oil Temperature within range Filtered Engine Speed within range	≥ 70.0 kPa FALSE Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA OilPmpTFTKO CrankSensor_FA Enabled : OilPmpTFTKO Enabled Fault bundles for control disable : OilPmpTFTKO EngineTorqueEstInaccurate EngOilPressureSensorFA PowertrainRelayFault CrankSensor_FA EngOilTempFA Disabled > 1.5 seconds -7.0 deg C ≤ Oil Temp ≤ 120.0 deg C 1,500 RPM ≤ Filtered Engine Speed ≤ 2,500		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						RPM		
					Engine Torque within range	**P06DD_P06DE_MinEnableTorque_OP** ≤ Indicated Requested Engine Torque ≤ **P06DD_P06DE_MaxEnableTorque_OP** (see P06DD details on Supporting Tables Tab **P06DD_P06DE_MinEnableTorque_OP** **P06DD_P06DE_MaxEnableTorque_OP**)		
					Delta Filtered Engine Speed within a range	ABS [Filtered RPM at beginning of State change - Filtered RPM after 1.0 seconds] ≤ 50 RPM		
					Filtered Oil Pressure within range	Filtered Engine Oil Pressure > **P06DD_P06DE_MinOilPressThresh** (see P06DD details on Supporting Tables Tab **P06DD_P06DE_MinOilPressThresh**)		
					Expected Oil Pressure Delta within range	25.0 kPa < ABS [**P0521_P06DD_P06DE_OP_HiStatePressure** - **P06DD_P06DE_OP_LoStatePressure**] < 215.0 kPa		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Two Stage Oil Pump Control Circuit StuckOn - Two Sided	P06DE	Diagnoses the two stage oil pump is stuck in the low pressure state	Fail from a passing state: Oil Pressure delta is less than a minimum delta pressure on a state change and the measured filtered oil pressure is below a threshold	Oil Pressure delta = ABS [Filtered Oil Pressure at beginning of state change - filtered oil pressure after 1.5 seconds] Oil Pressure delta < **P06DD_P06DE_OP_StateChangeMin** (see P06DE details on Supporting Tables Tab) Filtered Oil Pressure ≤ **P0521_P06DD_P06DE_OP_HiStatePressure** (**re** - **P06DD_P06DE_OP_LoStatePressure**) **÷ 2** (see P06DE details on Supporting Tables Tab)	Common Criteria: Two Stage Oil Pump is Present Engine Running Ambient Air Pressure Oil Aeration (= TRUE if engine speed > 10,000 RPM for longer than 30.0 seconds) No active DTC's for diagnsotic enable: Check oil pump TFTKO as a diagnostic enable when Enabled. No active DTC's for control enable: Active Criteria: One Sided Performance	TRUE ≥ 10.0 seconds ≥ 70.0 kPa FALSE Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA CrankSensor_FA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA Enabled : OilPmpTFTKO Enabled Fault bundles for control disable : OilPmpTFTKO EngineTorqueEstInaccurate EngOilPressureSensorFA PowertrainRelayFault CrankSensor_FA EngOilTempFA Disabled	≥ 12 errors out of 15 samples. Run once per trip or activiated by the Passive Test	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Test = Disabled			
					Oil Pump in Low State	> 1.5 seconds		
					Modelled Oil Temperature within range	-7.0 deg C ≤ Oil Temp ≤ 120.0 deg C		
					Filtered Engine Speed within range	1,500 RPM ≤ Filtered Engine Speed ≤ 2,500 RPM		
					Engine Torque within range	**P06DD_P06DE_MinEnableTorque_OP** ≤ Indicated Requested Engine Torque ≤ **P06DD_P06DE_MaxEnableTorque_OP** (see P06DE details on Supporting Tables Tab)		
					Delta Filtered Engine Speed within a range	ABS [Filtered RPM at beginning of State change - Filtered RPM after 1.0 seconds] ≤ 50 RPM		
					Filtered Oil Pressure within range	Filtered Engine Oil Pressure > **P06DD_P06DE_MinOilPressThresh** (see P06DD details on Supporting Tables Tab)		
					Expected Oil Pressure Delta within range	25.0 kPa < ABS [**P0521_P06DD_P06DE_OP_HiStatePressure** - **P06DD_P06DE_OP_LoStatePressure**] < 215.0 kPa		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Passive Criteria:			
					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 1.00 seconds] ≤ 1,000 RPM		
					Oil Pressure Delta < **P06DD_P06DE_OP_StateChangeMin** (see P06DE details on Supporting Tables Tab)	TRUE		
			Fast Pass Condition Oil Pressure delta is less than a minimum delta pressure on a state change and the measured filtered oil pressure is below a threshold	Oil Pressure delta = ABS [Filtered Oil Pressure at beginning of state change - filtered oil pressure after 1.5 seconds] Oil Pressure delta <	Common Criteria: Two Stage Oil Pump is Present Engine Running Ambient Air Pressure Oil Aeration (= TRUE if engine speed	 TRUE ≥ 10.0 seconds ≥ 70.0 kPa FALSE	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.
				P06DD_P06DE_OP_StateChangeMin (P06DD Performance Test Details on Supporting Tables Tab) Filtered Oil Pressure ≤ **P0521_P06DD_P06DE_OP_HiStatePressure** (**re** - **P06DD_P06DE_OP_LoStatePressure**) / 2 (P06DD Performance Test Details on Supporting Tables Tab)	> 10,000 RPM for longer than 30.0 seconds) No active DTC's for diagnsotic enable: Check oil pump TFTKO as a diagnostic enable when Enabled. No active DTC's for control : <u>Active Criteria:</u> One Sided Performance Test = Disabled Oil Pump in Low State Modelled Oil Temperature within range Filtered Engine Speed within range Engine Torque within range	Fault bundles: MAF_SensorFA ECT_Sensor_FA IAT_SensorFA CrankSensor_FA EngOilPressureSensorCktFA AmbientAirDefault EngOilTempFA Enabled : OilPmpTFTKO Enabled Fault bundles for control disable : OilPmpTFTKO EngineTorqueEstInaccurate EngOilPressureSensorFA PowertrainRelayFault CrankSensor_FA EngOilTempFA Disabled > 1.5 seconds -7.0 deg C ≤ Oil Temp ≤ 120.0 deg C 1,500 RPM ≤ Filtered Engine Speed ≤ 2,500 RPM **P06DD_P06DE_MinEnableTorque_OP** ≤		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						Indicated Requested Engine Torque ≤ **P06DD_P06DE_MaxEnableTorque_OP** (P06DD Performance Test Details on Supporting Tables Tab)		
					Delta Filtered Engine Speed within a range	ABS [Filtered RPM at beginning of State change - Filtered RPM after 1.0 seconds] ≤ 50 RPM		
					Filtered Oil Pressure within range	Filtered Engine Oil Pressure > **P06DD_P06DE_MinOilPressThresh** (see P06DD details on Supporting Tables Tab)		
					Expected Oil Pressure Delta within range	25.0 kPa < ABS [**P0521_P06DD_P06DE_OP_HiStatePressure** - **P06DD_P06DE_OP_LoStatePressure**] < 215.0 kPa		

16 OBDG05 ECM Summary Tables (Unique 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

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Temperature Sensor Circuit High	P105B	Indicates that the capacitor temperature is out of range - low	Stop-Start capacitor temperature value	< -60.0 deg C	No active DTCs Diagnostic reporting is enabled when the following two steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec	10 failure out of 14 samples 500ms cycle time continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Temperature Sensor Circuit Low	P105C	Indicates that the capacitor temperature is out of range - high	Stop-Start capacitor temperature value	> 180.00 deg C	No active DTCs Diagnostic reporting is enabled when the following two steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec	10 failure out of 14 samples 500ms cycle time Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Temperature Sensor Not Plausible	P105D	Indicates that the capacitor temperature is not rational/plausible	Absolute value of temperature difference between capacitor and DCDC converter AND Absolute value of temperature difference between capacitor and capacitor switch (K2)	> 0.12 deg C > 0.12 deg C	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) ECM off time Then, (B) LIN bus wake up Then, (C) ESCM wake up delay Note: This is not a continuous diagnositc. It runs once at LIN bus wake up, after ECM off time is large enough.	U135C, U1347, P1066 > 28,800 sec = TRUE > 0.50 sec	Wake up test only. Fault is set at first detection.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module DCDC Converter Temperature Sensor Circuit High	P105E	Indicates that the DCDC converter temperature is out of range - low	DCDC converter temperature	< -50.00 deg C	No active DTCs Diagnostic reporting is enabled when the following two steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec	10 failure out of 14 samples 500ms cycle time continuous	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module DC/ DC Converter Temperature Sensor Circuit Low	P105F	Indicates that the DCDC converter temperature is out of range - high	DCDC converter temperature	> 160.00 deg C	No active DTCs Diagnostic reporting is enabled when the following two steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec	10 failure out of 14 samples 500ms cycle time continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module DC/ DC Converter Temperature Sensor Not Plausible	P1060	Indicates that the DCDC converter temperature is not rational/plausible	The absolute value of temperature difference between DCDC converter and capacitor. AND The absolute value of temperature difference between DCDC converter and capacitor switch (K2).	> 0.12 deg C > 0.12 deg C	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) ECM off time Then, (B) LIN bus wake up Then, (C) ESCM wake up delay Note: This is not a continuous diagnositc. It runs once at LIN bus wake up, after ECM off time is large enough.	U135C, U1347, P1066 > 28,800 sec = TRUE > 0.50 sec	Wake up test only. Fault is set at first detection.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Secondary Switch Temperature Sensor Circuit High	P1061	Indicates that the capacitor switch (K2) temperature is out of range - low	Capacitor switch (K2) temperature	< -50.00 deg C	No active DTCs Diagnostic reporting is enabled when the following two steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec	10 failure out of 140 samples 500ms cycle time continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Secondary Switch Temperature Sensor Circuit Low	P1062	Indicates that the capacitor switch (K2) temperature is out of range - high	The capacitor switch (K2) temperature	> 160.00 deg C	No active DTCs Diagnostic reporting is enabled when the following two steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec	10 failure counts out of 14 samples 500ms cycle time continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Secondary Switch Temperature Sensor Not Plausible	P1063	Indicates that the Capacitor Switch (K2) Temperature Sensor Not Rational/Plausible	The absolute value of temperature difference between the capacitor switch (K2) and the capacitor. AND The absolute value of tempeature difference between the capacitor switch (K2) and DCDC converter.	> 0.12 deg C > 0.12 deg C	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) ECM off time Then, (B) LIN bus wake up Then, (C) ESCM wake up delay Note: This is not a continuous diagnositc. It runs once at LIN bus wake up, after ECM off time is large enough.	U135C, U1347, P1066 > 28,800 sec = TRUE > 0.50 sec	Wake up test only. Fault is set at first detection.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Status Message Counter Incorrect	P1066	This DTC indicates that an error is detected on the Alive Rolling Counter (ARC) in the LIN frame data	If one or more of the following Alive Rolling Counter (ARC) errors in LIN frames from the capacitor control module has matured, P1066 is set: ARC error counts for UCAP Current Status frame OR ARC error counts for UCAP Temperature Status frame OR ARC error counts for UCAP Temperature Fault frame OR ARC error counts for UCAP Part Number frame	 >= 10 failures ouf of 10 samples >= 10 failures out of 10 samples >= 10 failures out of 10 samles >= 10 failures out of 10 samples	Diagnostic reporting is enabled when the following conditions are met: (A) LIN bus wake up Then, (B) Diagnostic delay (C) Powertrain Relay Voltage (D) Run/Crank Ignition Voltage	 = TRUE >= 3.00 sec >= 11.00 V >= 11.00 V	Executes in 12.5 ms loop Continuously	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Performance	P1067	This DTC Indicates one or more of the following faults have occured: Case 1: The ground switch (K1) current sensor is faulty. Case 2: The capacitor switch (K2) current sensor is faulty. Case 3: The onboard voltages indicate a faulty voltage regulator. Case 4: The analog input circuits are faulty. Case 5: The capacitor voltage sensor is stuck at maximum.	The ground switch (K1) current is out of range	< -1330 amps OR > 1330 amps	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.51 sec	Test cycle time is 5ms Error count increases by 10 if an error is detected, up to a maximum value of 200. Error count decreases by 1 if no error is detected, minimum value 0. Fault is set when error count = 200 (100ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type B, 2 Trips
			The ground switch (K2) current is out of range	< -1330 amps > 1330 amps	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then,	U135C, U1347, P1066 = TRUE	Test cycle time is 5ms Error count increases by 10 if an error is detected, up to a maximum value of 200. Error count	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					(B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	> 0.50 sec > 0.51 sec	decreases by 1 if no error is detected, minimum value 0. Fault is set when error count = 200 (100ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	
			Internal Power Supplies (2.5V Reference, 5V Linear regulator, 15V Boost regulator) are not functional or out of range.	Correct range is: 2.5V +/- 0.1% 5V +/- 0.2V 15V +/- 1V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; ; or whenever fault state from ESCM changes its value	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.51 sec	Test cycle time is 5ms Error count increases by 100 if an error is detected, up to a maximum value of 200. Error count decreases by 1 if no error is detected, minimum value 0. Fault is set when error count = 200 (10 ms fault maturity) Fault is removed	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Afterwards, this diagnostic runs continuously.		when error count = 0. (1 sec healing time)	
			The analog input circuits are faulty: Measured 2.5V Reference voltage of out of range, which is a indicator that the analog inputs to A/D converter are faulty	<2.23 V OR > 2.78 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: Internal Power Supplies DCDC	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.51 sec = OK = Not active	Test cycle time is 5ms Error count increases by 20 if an error is detected, up to a maximum value of 200. Error count decreases by 1 if no error is detected, minimum value 0. Fault is set when error count = 200 (50ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	
			The measured capacitor voltage	>=5.86 V	No active DTCs Diagnostic reporting is enabled when the following three steps	U135C, U1347, P1066	Test cycle time is 10ms Error count increases by 10 if an error is	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	 = TRUE > 0.50 sec > 0.51 sec	detected, up to a maximum value of 100. Error count decreases by 1 if no error is detected, minimum value 0. Fault is set when error count = 100 (100ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Deteriorated	P1068	This DTC Indicates the end of life of the capacitor.	Capacitance OR Equivalent serial resistance(ESR) OR Number of consecutive cycles in which one of the capacitor cells has a voltage 0.6V lower than the other.	< 480 Farads > 3.6 milliion Ohm = 10 times	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Note: This is not continuous diagnostic.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.10 sec	The capacitance and ESR are calculated during state of health determination. Fault is set after first detection. Cell voltage difference is calculated after ESCM wake up. Fault is set after 10 consecutive detections. This is a persistent fault that can only be removed by service.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Voltage High	P1069	This DTC indicates that the capacitor is over voltage.	capacitor voltage	> 5.8 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.51 sec	Test cycle time 10ms Error count increases by 2 if an error is detected, up to a maximum value of 100. Error count decreases by 1 if no error is detected, minimum value 0. Fault is set when error count = 100 (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Battery Negative Circuit Driver "A" and "B" Stuck Open	P106A	This DTC indicates that the ground swith (K1) is in a high impendance state	Voltage drop across the ground switch (K1) when current > 550 amps OR Voltage drop across the ground switch (K1) when current > 550 amps OR Voltage drop across the ground switch (K1) when current <= 550 amps OR Voltage drop across the ground switch (K1) when current <= 550 amps	<-0.8 V > 0.8 V <-0.4 V > 0.4V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the folloiwng conditions are met: Capacitor switch (K2) open Ground switch (K1) close is commanded	U135C, U1347, P1066 = TRUE > 0.50 sec > 1.01 sec = TRUE = TRUE	Test cycle time is 10ms. Error count increases by 1 if an error is detected, up to a maximum of 100. Error count decreases by 1 if no error is detected, up to a minimum of 0. Fault is set when error count = 100. (1 sec fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Ground Switches "A" or "B" Stuck Open	P106B	Indicates that both banks of ground switch (K1) stuck open, cannot be closed	The ground switch (K1) flip-flop state. Note: flip-flop is a basic hardware component used by software to command the switch to open or close. K1 driver voltage bank A K1 driver voltage bank B	= stuck open < 10.46 V < 10.46 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: Ground switch is commanded to close	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.05 sec = TRUE	Test cycle time is 5ms. Error count increases by 20 if an error is detected, up to a maximum of 200. Error count decreases by 1 if no error is detected, up to a minimum of 0. Fault is set when error count = 200. (50ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Charge Pump Performance	P106D	Indicates that the charge pump (internal safety supply voltage) does not work correctly.	The Internal safety supply voltage	< 11.23 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met, once per drive cyle: Capacitor voltage Authorization to support start	U135C, U1347, P1066 = TRUE > 0.50 sec > 1.10 sec > = 4.7V = FALSE	Tested once per driving cycle. Needs enabling from SW: enable - wait 500ms - diagnose during 500 ms - disable. Test cycle time 10 ms. Error count increases by 10 if an error detection occurs up to a maximum of 100. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 100. (100ms fault maturity) Fault can only be removed in the next wake up, or by LIN message.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module State of Health Unkown	P106E	This DTC indiates that the capacitor control module state of health has not been determined	The ESCM state of health	Has not been determined.	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Note: This diagnostic runs once per trip.	U135C, U1347, P1066 = TRUE > 0.50 Sec > 10.00 sec	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.
Stop-Start Capacitor Control Module Self Test Incomplete	P106F	This DTC indicates that the self test of the capacitor control module has not been performed/completed for multiple driving cycles	Consecutive driving cycles in which the self-test has not been performed/completed	>=11 drive cycles	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Note: This diagnostic runs at wake up using information from previous power down.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.03	Wake up test only. Fault is set after first detection. Fault can be healed if the self test is performed/ completed without errors in the last driving cycle.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Output Circuit	P1070	This DTC indicates that the capacitor voltage output line is disconnected or the DCDC is defective.	The capacitor voltage increase rate after 5s of charge	<20 mV/s	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Note: This diagnostic runs at every charge when the following conditions are met: DCDC charging Capacitor voltage	U135C, U1347, P1066 = TRUE > 0.50 sec > 5.00 sec = Active > 0.5 V	First 5 seconds of each charge. Fault is set after first detetion. Once Fault is set, it will persist in the same driving cycle, and inhibit use of DCDC. Fault will be removed in the next wake up or by LIN message.	Type A, 1 Trips
			Capacitor output voltage Capacitor (dual cell) mid point voltage	< 0.5 V > 0.8 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up	U135C, U1347, P1066 = TRUE	Test cycle time is 5ms. Error count increases by 10 if an error detection occurs up to a maximum	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	 > 0.50 sec > 5.00 sec	of 100. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 100. (50ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	
			The difference between the following items (A) and (B) (A) the sum of 3 Capacitor voltage samples (sampled with a 10ms reccurence after DCDC starts charging) (B) the Capacitor voltage sampled before starting the charge multiplied by 3	> 2.7 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM	U135C, U1347, P1066 = TRUE > 0.50 sec > 5.00 sec	First 30ms every time DCDC charging is active. Fault is set after first detetion. Once Fault is set, it will persist in the same driving cycle, and inhibit use of DCDC. Fault will be removed in the next wake up or by LIN message	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					changes its value Note: This diagnostic runs at every charge, when the following conditions met: DCDC charging	 = Active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Read Only Memory Performance	P1071	This DTC indicates a failure of the ROM (flash program memory)	The calculated checksum across the ROM memory doesn't match the stored checksum computed during the build of the software.	checksum does not match.	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec 0.01 sec	10ms cycle time to scan a portion of ROM. The whole memory is scanned in less than 2.6 seconds. If fault is detected, perform a reset up to a predefined number of times (5 times). if this number has expired go to a Fail Safe State that can only be left by ECU powerdown Note: in Fail Safe State, LIN communication is on, K1 is closed, DCDC is off. Fault can only be removed in next wake up or by LIN message.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Random Access Memory Performance	P1072	This DTC indicates a failure of the RAM.	An error is detected while testing the RAM.	RAM memory cell is stuck at high or low	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received. or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.01 Sec	10ms cycle time to scan a portion of RAM. The whole memory is scanned in less than 2.6 seconds. Fault is detected when one of the cells is not functioning correctly. If fault is detected, perform a reset up to a predefined number of times (5 times). If this number has expired go to a Fail Safe State that can only be left by ECU Powerdown Note: in Fail Safe State, LIN communication is on, K1 is closed, DCDC is off. Fault can only removed in next	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							wake up or by LIN message.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Long Term Memory Performance	P1073	Indicates a failure of the EPROM.	CRC checksum calculation of the non volatile memory blocks	The calculated CRC doesn't match the stored CRC	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Note: diagnostic runs at control module wake up.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.10 sec	EEPROM is scanned at control module wake up. Fault is set at first detection. Fault can only be removed in next wake up, or by LIN message.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Long Term Memory Reset	P1074	Indicates that the capacitor control module has had unexpected number of reset.	unexpected reset counter	>= 15	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Note: diagnostic runs at capacitor control module wake up.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.10 sec	Capacitor control module wake up test only. Each unexpected reset increments the Unexpected Resets counter by 3 up to a maximum of 15. Each expected reset decrements the conter by 1 up to a minimum of 0. Fault is set when the counter reaches 15. Fault can only by removed in next wake up, or by LIN message.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Start-Stop Capacitor Sense Circuit Low	P1075	Indicates that the capacitor middle point line is in an open circuit state or there is a short to GND or the capacitor is defective.	Voltage increase rate of the capacitor after 5 seconds of charge	<10 mV/s	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: DCDC charging Charging current	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.03 sec = active >40 Amps	Detection is done in the first 5 seconds at each charge. Fault is set at first detection. Fault can only be removed at next wake up, or by LIN message.	Type A, 1 Trips
			The capacitor (dual cell) mid point voltage before starting balance The capacitor (dual cell) mid point voltage after starting balance. Note: balance is to make	<0.1 V >0.8 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up	U135C, U1347, P1066 = TRUE	Detect after each balance of capacitor cells. Fault is set at first detection. Once set, this fault will inhibit	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			the capacitor voltage equally distributed to the two cells.		Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Then, this diagnostic runs after each balance.	 > 0.50 sec > 0.03 sec	further cells balancing. Fault can only be removed in the next wake up or by LIN message.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Start-Stop Capacitor Sense Circuit High	P1076	Indicates that the capacitor middle point line shows high voltage.	Capacitor mid point line voltage	> 4.8 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec > 2.10 sec	Test cycle time is 100ms. Error count increases by 1 if an error is detected, up to a maximum of 20. Error count decreases by 1 if no error is detected, up to a minimum of 0. Fault is set when error count = 20. (2 sec fault maturity) Fault is removed when error count = 0. (2 sec healing time)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module LIN System Voltage High	P1078	Indicates that the LIN supply voltage is too high.	LIN supply voltage	>17.16V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: Ground switch (K1) Capactor switch (K2)	U135C, U1347, P1066 = TRUE > 0.50 sec > 5.00 sec = Closed = Open	Test cycle time is 10ms. Error count increases by 2 if an error is detected up to a maximum of 100. Error count decreases by 1 if no error is detected up to a minimum of 0. Fault is set when error count = 100. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module DC/ DC Converter System Voltage High	P107B	Indicates that the battery voltage is too high.	Measured battery voltage	> 17.06V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously when the following conditions are met: Measured LIN supply voltage	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.11 sec > 6.5V + 380mv hysteresis	Test cycle time is 10ms. Error count increases by 10 if an error detection occurs up to a maximum of 100. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 100. (100ms fault maturity) Fault is removed when error count = 0. (1 sec healing time).	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Control Module Backup System Voltage High	P107E	Indicates that the external safe supply voltage is too high.	Measured external safe supply voltage	> 17.16 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Aftterwards, this diagnostic runs when the following conditions are met: Ground switch (K1) Capacitor switch (K2)	U135C, U1347, P1066 = TRUE > 0.50 sec > 5.00 sec = close =open	Test cycle time is 100ms. Error count increases by 2 if an error is detected, up to a maximum of 10. Error count decreases by 1 if no error is detected, up to a minimum of 0. Fault is set when error count = 10. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Battery Negative Circuit Driver "A" Low	P1080	Indicates that the ground switch (K1) bank A driver is stuck at open when should be closed	Gound switch (K1) bank A gate voltage is low. Note: the gate voltage is to assure that the switch stays closed when commanded.	< 10.5V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: Measured LIN supply voltage Ground switch (K1) is commanded to close according to flip-flop output	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.50 sec > 6.5V+380 mv hysteresis = TRUE	Test cycle time is 5ms. Error count increases by 2 if an error detection occurs up to a maximum of 200. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 200. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Battery Negative Circuit Driver "A" High	P1081	Indicates that the ground switch (K1) bank A driver is stuck at closed when should be open	Ground switch (K1) bank A gate voltage	> 2.0 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: Ground switch (K1) is commaned to open according to flip-flop output	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.05 sec = TRUE	Test cycle time is 5ms. Error count increases by 20 if an error detection occurs up to a maximum of 200. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 200. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Battery Negative Circuit Driver "A"-"B" Not Plausible	P108A	Indicates that the difference between the ground switch (K1) bank A gate voltage and bank B gate voltage is too high.	The absolute value of difference between the following two items (A) and (B) (A) K1A gate voltage (B) K1B gate voltage	> 2.0 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously	U135C, U1347, P1066 = TRUE > 0.50 sec > 5.00 sec	Test cycle time is 100ms. Error count increases by 2 if an error detection occurs up to a maximum of 10. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 10. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Battery Negative Circuit Driver "B" Low	P108B	Indicates that the ground switch (K1) bank B driver is stuck at open when should be closed	Gound switch (K1) bank B gate voltage	<10.5 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received. Afterwards, this diagnostic runs when the following conditions are met: Measured LIN supply voltage Ground switch (K1) is commanded to close according to flip-flop output	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.50 sec >6.5V+380mv hysteresis = TRUE	Test cycle time is 5ms. Error count increases by 2 if an error detection occurs up to a maximum of 200. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 200. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Battery Negative Circuit Driver "B" High	P108C	Indicates that the ground switch (K1) bank B is stuck at closed when should be open	Ground switch (K1) bank B gate voltage	>2.0 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received. Afterwards, this diagnostic runs when the following conditions are met: Ground switch (K1) is commanded to close according to flip-flop output	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.05 sec = TRUE	Test cycle time is 5ms. Error count increases by 20 if an error detection occurs up to a maximum of 200. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 200. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module DC/ DC Converter Discharging Performance	P108D	Indicates that one or more of the following faults have occurred: Case 1) DCDC does not stop charging when requested; Case 2) DCDC is unable to discharge the capacitor	DCDC does not stop charging when requsted Charging current	 >10A	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: DCDC disabled OR DCDC discharging	U135C, U1347, P1066 = TRUE > 0.50 sec > 15.00 sec = TRUE = TRUE	Test cycle time is 10ms. Error count increases by 1 if an error detection occurs up to a maximum of 200. Error count decreases by 2 if no error detection occurs up to a minimum of 0. Fault is set when error count = 200. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			DCDC is unable to discharge the capacitor: Capacitor voltage decreases rate	 < 6mv/S in first 15 sec discharging time	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: DCDC discharging Capacitor voltage	U135C, U1347, P1066 = TRUE > 0.50 sec > 15.00 sec = TRUE > 0.5 V	Detect during first 15 seconds ot discharging. Fault is set after first detection. Fault can only be removed in the next wake up, or by LIN message.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capcitor Control Module DC/ DC Converter Charging Performance	P108E	Indicates that one or more of the following faults have occurs: Case 1) Charge current is too high Case 2) DCDC does not charge when requested	Charge current is too high Phase 1 charge current OR Phase 2 charge current	 > 36.75A > 68.25A	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: DCDC charging	U135C, U1347, P1066 = TRUE > 0.50 sec > 2.10 sec = TRUE	Test cycle time is 10ms. Error count increases by 10 if an error detection occurs up to a maximum of 100. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 100. (100ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type A, 1 Trips
			DCDC does not charge when requested: ********** Condition (I) if DCDC is charging with half current OR capacitor voltage > 4V ********** Charge current	 < 15 Amps	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay	U135C, U1347, P1066 = TRUE > 0.50 Sec	Detection starts after 500ms charge. Test cycle time is 100ms. Error count increases by 1 if an error detection occurs up to a maximum of 20.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			********** Condtion (II) if DCDC is charging with full current AND capacitor voltage <= 4 V **********		Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received.	> 2.10 sec	Error count decreases by 1 if no error detection occurs up to a minimum of 0.	
			Charge current	< 30 Amps	Note: After intial time delay, diagnostic runs if the following conditions satisfy:		Fault is set when error count = 20.	
					DCDC charging	= TRUE	Fault is removed when error count = 0.	
					DCDC charging time	>= 500ms		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Self Test Failed	P108F	Indicates that one ore more of the following faults have occurred: Case 1) Unable to switch over to capacitor switch (K2) during self test; Case 2) An unintended switchover to capacitor switch (K2) during self test; Case 3) Capacitor switch (K2) is in a high impedance state or diode mode during self test;	Unable to switch over to capacitor swith (K2) during self test if either (A) or (B) is TRUE: (A) when the measured battery voltage < 13.3 V, hardware current comparator output stuck at passive. Note: hardware current comparator is used to automatically provoke a switch if the current flowing through the ground switch (K2) is greater than a threshold. (B) when the measured battery voltage >= 13.3 V, hardware voltage comparator is stuck at passive. Note: hardware voltage comparator is used to automatically provoke a switch if the battery voltage is less than a threshold.	n.a. n.a.	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Note: This is not continuous diagnostic.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.10 sec	Detect during part two of the self test procedure (before Powerdown) only if there was no switch in the drving cycle. Fault is set after first detection. Fault can only be removed in the following driving cycle when self test runs again.	Type A, 1 Trips
			Uintended switchover to capacitor switch (K2) during self test if either (A) or (B) is TRUE: (A) when the measured battery voltage is not in the range of 3.3V and 7.5V, hardware current	n.a.	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up	U135C, U1347, P1066 = TRUE	Detect during part one of the self test procedure (before Powerdown). Fault can only be removed in the	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			comparator output is always triggerred Note: hardware current comparator is used to automatically provoke a switch if the current flowing through the ground switch (K2) is greater than a threshold. (B) when the measured battery voltage is in the range of 3.3V and 7.5V, hardware voltage comparator output is always triggerred. Note: hardware voltage comparator is used to automatically provoke a switch if the battery voltage is less than a threshold (9.5V)	n.a.	Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Note: This is not continuous diagnostic.	> 0.50 sec > 0.10 sec	following driving cycle when self test runs again.	
			Capacitor switch (K2) is in a high impedance state or diode mode during self test; Measured battery voltage jumps immediately after the switch.	< 1 V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.10 sec	Detect during part two of the self test procedure (before Powerdown). Fault can only be removed in the following driving cycle when self test runs again.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: Measured capacitor voltage Capacitor switch (K2) Ground switch (K1)	 > 2V = Closed = Open		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Internal Circuitry Performance	P1090	Indicates a power interconnection defect on control board/power board	Measured 2.5V reference voltage	<2.18V OR >2.83V	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: Internal power supply DCDC charging OR discharging	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.51 sec = OK = TRUE	Test cycle time is 10ms. Error count increases by 2 if an error detection occurs up to a maximum of 100. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 100. (500ms fault maturity) Fault is removed when error count = 0. (1 sec healing time)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Stop-Start Capacitor Control Module Switch Deteriorated	P1091	Indicates one or more of the following faults have occurred: Case 1) Ground switch (K1) is in short circuit when it should be open Case 2) Capacitor switch (K2) is in a high impedance or in diode mode when it should be closed. Case 3) Capacitor switch (K2) close command does not close K2 when required. Case 4) Capacitor control module has reached its end of life.	Ground switch (K1) current measurement AND Capcitor switch current measurement	< -120 Amps > 60Amps	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value. Afterwards, this diagnostic runs when the following conditions are met: Capacitor swithc (K2) closed	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.03 sec = TRUE	Test cycle time is 1ms. Error count increases by 10 if an error detection occurs up to a maximum of 100. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 100. (10ms fault maturity) Fault is removed when error count = 0. (100ms healing time)	Type A, 1 Trips
			Measured ground switch (K1) current AND Measured capacitor switch (K2) current	> 40A < 30A	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay	U135C, U1347, P1066 = TRUE > 0.50 sec	Test cycle time is 1ms. Error count increases by 10 if an error detection occurs up to a maximum of 100. Error count decreases by 1 if no error	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met: Capacitor switch (K2)	> 0.03 sec = Closed	detection occurs up to a minimum of 0. Fault is set when error count = 100. (10 ms fault maturity) Fault is removed when error count = 0. (100ms healing time)	
			Capacitor switch (K2) stuck at open when it should be closed	n.a.	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) Diagnostic delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs when the following conditions are met:	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.03 sec	Test cycle time is 10ms. Error count increases by 34 if an error detection occurs up to a maximum of 102. Error count decreases by 1 if no error detection occurs up to a minimum of 0. Fault is set when error count = 102. (30ms fault maturity) Fault is removed when error count	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Capacitor switch (K2) is commanded to close, according to flip-flop output	= TRUE	= 0. (1.2 sec healing time)	
			Number of switchbacks between ground switch (K1) and capacitor switch (K2)	> 2 million times	No active DTCs Diagnostic reporting is enabled when the following three steps finish: (A) LIN bus wake up Then, (B) ESCM wake up delay Then, (C) Fault maturity delay expires, and the next valid LIN frame has been received; or whenever fault state from ESCM changes its value Afterwards, this diagnostic runs continuously.	U135C, U1347, P1066 = TRUE > 0.50 sec > 0.03 sec	Detect after every switch-back. Fault is set after first detection. This fault is permament, can only be removed by service tool.	

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	<= 150 kPa*(g/s) > 9.0 grams/sec > 20.0 kPa) > 10.0 kPa	Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. -	>= 300 RPM <= 6,800 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 Filtered Throttle Model Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM** Modeled Air Flow Error multiplied by **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on RPM** and **P0101, P0106, P010B, P0121, P012B, P0236, P1101: MAF1 Residual Weight Factor based on MAF Est** MAP Model 1 Error multiplied by	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.
						P0101, P0106, P0121, P012B, P0236, P1101: MAP1 Residual Weight Factor based on RPM MAP Model 2 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP		
					No Active DTCs: No Pending 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.
Communication Error with Active Grill Air Shutter Module “A”	P151E	This DTC monitors for an internal error or error in communication with the Active Grill Air Shutter Module A	Communication of the Alive Rolling Count from the Shutter Module over LIN bus is incorrect or the Shutter Module signals it has an internal error for out of total samples	 >= 10.00 counts >= 10.00 counts	All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	>= 3.00 seconds = Run >= 11.00 Volts >= 11.00 Volts	LIN bus communication executes in 500ms loop	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.	For button type Normal_Button Analog Mode Switch low voltage threshold % of 5V range For button type Enhanced_Button Analog Mode Switch low voltage threshold % of 5V range For button type Mulitple_Button Analog Mode Switch low voltage threshold % of 5V range	 < 29.00 % < 24.30 % < 21.20 %	Vehicle mode analog switch button type	= CeDMDG_e_Normal_Button	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.	For button type Normal_Button Analog Mode Switch high voltage threshold % of 5V range For button type Enhanced_Button Analog Mode Switch high voltage threshold % of 5V range For button type Mulitple_Button Analog Mode Switch high voltage threshold % of 5V range	 >= 88.80 % >= 94.10 % >= 95.30 %	Vehicle mode analog switch button type	= CeDMDG_e_Normal_Button	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.	For button type Normal_Button Analog Mode Switch indeterminate region % of 5V range For button type Enhanced_Button Analog Mode Switch indeterminate regions % of 5V range For button type Mulitple_Button Analog Mode Switch indeterminate regions % of 5V range	66.80 % ≤ % of 5 volts < 72.80 % 63.50 % ≤ % of 5 volts < 65.50 % 83.50 % ≤ % of 5 volts < 85.50 % 52.90 % ≤ % of 5 volts < 54.10 % 74.10 % ≤ % of 5 volts < 75.30 % 87.50 % ≤ % of 5 volts < 88.60 %	Vehicle mode analog switch button type	= CeDMDG_e_Normal_Button	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.
Auto Start Stop Select Switch Signal Circuit Stuck High Include ONLY for start stop conventional hybrid applications	P15A2	Digital Mode Switch A stuck high diagnostic - for hybrid type of auto start stop	Digital Mode Switch A stuck high diagnostic - for hybrid type of auto start stop	Digital mode switch A fail timer > 600.00	Digital mode switch A diagnostic enable Mode switch A active Hybrid type	= 0.00 = TRUE =CeINFR_e_StartStopConv	100 ms / sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Auto Start Stop Select Switch Signal Circuit Include ONLY for start stop conventional hybrid applications	P15A3	For start stop conventional hybrid applications, this diagnoses the auto start stop select signal circuit (BCM to ECM Rolling Count check).	Rolling count value received from BCM does not match expected value	= TRUE	Engine Speed Engine Speed Engine speed between min/max for Vehicle Speed for	≥ 200 RPM ≤ 7,500 RPM ≥ 5.0 seconds ≤ 318.14 MPH ≥ 5.0 seconds	> 3 error counts for > 10.0 seconds 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.
Battery Monitor Sensor Signal Message Counter Incorrect	P15FF	This DTC monitors for an internal error or error in communication with the Battery Monitor Signal	Communication of the Alive Rolling Count from the Battery Monitor Module over LIN bus is incorrect or the Battery Monitor Module signals it has an internal error for out of total samples	>= 10 counts >= 10 counts	All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	>= 3.00 seconds = Run >= 11.00 Volts >= 11.00 Volts	Fastest periodic communication rate to Battery Monitor Module on LIN bus executes at 250ms.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Ignition Voltage Correlation #2	P16A7	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the Powertrain Relay Ignition Voltage #2	|Run/Crank – PT Relay Ignition| >	3.00 Volts		Powertrain commanded on AND (Run/Crank voltage > Table, f(IAT). See supporting tables: **P1682_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 0.175 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Controls Ignition Relay Feedback Circuit 2 High Voltage - (GEN III Controllers ONLY)	P16B3	Diagnoses ignition feedback circuit 2 high voltage	Engine controls ignition relay feedback circuit 2 high voltage	Relay voltage >= 4.00	Powertrain relay high diag enable Powertrain relay state	= 1.00 = INACTIVE	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Circuit Low Voltage	P16D4	This DTC monitors for a battery module low voltage circuit fault	Battery Module signals a low voltage circuit fault via LIN bus VeVITR_e_BatVoltOOR_LoDiag	= CeVITR_e_DiagFailed	The diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature	= 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius	Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Circuit High Voltage	P16D5	This DTC monitors for a battery module high voltage circuit fault	Battery Module signals a high voltage circuit fault via LIN bus VeVITR_e_BatVoltOOR_HiDiag	= CeVITR_e_DiagFailed	The diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature	= 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius	Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Current Low	P16D6	This DTC monitors for a battery module current low fault	Battery Module signals a current low fault via LIN bus VeVITR_e_ShuntVoltOOR_LoDiag	= CeVITR_e_DiagFailed	The diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature	= 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius	Diagnostic runs in the 250 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 COMPLETE Battery Module Monitor Timer Performance	P16DC	This DTC monitors for a battery module timer performance fault	Battery Module timer is inactive for Case 1: Wake Up Test LIN Bus Off Timer / 1,800.00 seconds or (LIN Bus Off Timer + 1,800.00 seconds) / 1,800.00 seconds or (LIN Bus Off Timer - 1,800.00 seconds) / 1,800.00 seconds Case 2: Sequential Test Sequential Test is enabled	 = the IBS Maximum Down Counter Value of 24 counts = the IBS Maximum Down Counter Value of 24 counts = the IBS Maximum Down Counter Value of 24 counts = 0 (1 indicates enabled)	The diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature Historical Temperature Data Trigger Request Module Off Timer Fault Active Run Crank Low Timer Error Code Clear Request IBS Measure Temperaure Data Available TPTKO OR TFTKO	= 0 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius = 1 (initializes to 0 then transitions to 1 once data is available- NEED TO SEE POSITIVE RISING EDGE) = False = False = False (latched when set True) = True = False (when KeVITD_b_TimerPerf_DFIRDisable = 0)	Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					IBS Down Counter Value	Calibration is set to 0 Not equal to 25.00		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Current High	P16DD	This DTC monitors for a battery module current high fault	Battery Module signals a current high fault via LIN bus VeVITR_e_ShuntVoltOOR_LoDiag	= CeVITR_e_DiagFailed	The diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature	= 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius	Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Internal Temperature Circuit Low	P16DE	This DTC monitors for a battery module internal temperature circuit low fault	Battery Module raw temperature 1 value	> 120.00 Celsius	The historical mode diagnostic is enabled and / or The continuous mode diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature For Historical Mode IBS Down Counter (over LIN bus) For Continuous Mode IBS Down Counter (over LIN bus) IBS Measure Temperature Data Available over LIN bus	= 1 (1 indicates enabled) = 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius Between 1 and 24 or zero = zero = True	4 failed samples within 5 total samples Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Internal Temperature Circuit High	P16DF	This DTC monitors for a battery module internal temperature circuit high fault	Battery Module raw temperature 1 value	< -43.00 Celsius	The historical mode diagnostic is enabled and / or The continuous mode diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature For Historical Mode IBS Down Counter (over LIN bus) For Continuous Mode IBS Down Counter (over LIN bus) IBS Measure Temperature Data Available over LIN bus	= 1 (1 indicates enabled) = 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius Between 1 and 24 = zero = True	4 failed samples within 5 total samples Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Random Access Memory (RAM) Error	P16E1	This DTC monitors for a battery module RAM memory fault	Battery Module signals a RAM memory fault via LIN bus VeVITR_e_IBS_IntRAM_ Fault	= CeVITR_e_DiagFailed	The diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature	= 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius	Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Read Only Memory (ROM) Error	P16E2	This DTC monitors for a battery module ROM memory fault	Battery Module signals a ROM memory fault via LIN bus VeVITR_e_IBS_IntROM_ Fault	= CeVITR_e_DiagFailed	The diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature	= 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius	Diagnostic runs in the 250 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Battery Monitor Module Data Incompatible	P16E3	This DTC monitors for a battery module data incompatible fault	Battery Module data received over LIN bus is incompatible. (Measured by any of the following) Absolute value of IBS battery capacity C20 data (IBS Return Nominal C20 - 80.00 Ah) or IBS Returns a battery type that is not equal to or Absolute value of (IBS Return Battery Calibration#1 U40@25 C - 12.11 V) or Absolute value of (IBS Return Battery Calibration#1 U80@25 C - 12.65 V)	 > 5.00 Ah CeBSER_e_IBS_Cfg BatAGM > 0.50 Volts > 0.50 Volts	The historical mode diagnostic is enabled and / or The continuous mode diagnostic is enabled System Diagnostics Disabled Power Mode 12V System Reference Voltage LIN Bus Off or Battery Module Communication Faults Active Outside Air Temperature Host Controller MEC Counter IBS Configuration Data Available over LIN bus	= 1 (1 indicates enabled) = 1 (1 indicates enabled) = False Not equal off > 9.00 Volts and < 99.00 Volts = False > -20.00 Celsius and < 50.00 Celsius <= 0 = True	Diagnostic runs in the 250 ms loop	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Surge Solenoid Circuit Open	P171A	Detects when the surge accumulator control circuit is failed open	HWIO fault status	= Failed Open	Ignition voltage	≥ 6.41 volts	≥ 32.00 fail count out of ≥ 40.00 sample count Frequency 12.5ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Surge Solenoid Circuit Low	P171B	Detects when the surge accumulator control circuit is failed short to ground	HWIO fault status	= Failed Short to Ground	Ignition voltage	≥ 6.41 volts	≥ 32.00 fail count out of ≥ 40.00 sample count Frequency 12.5ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Surge Solenoid Circuit High	P171C	Detects when the surge accumulator control circuit is failed short to power	HWIO fault status	= Failed Short to Power	Ignition voltage	≥ 6.41 volts	≥ 6.00 fail count out of ≥ 8.00 sample count Frequency 12.5ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Surge Accumulator System Performance	P171D	Detects when the surge accumulator system is not capable of supplying adaquate hydraulic pressure during the autostart. The diagnostic will monitor transmission clutch slip during the autostart event as the primary malfunction criteria.	Transmission turbine speed is greater than predicted turbine speed during autostart event	**P171D predicted ≥ turbine speed error** Refer to "Transmission Supporting Tables" for details	PRNDL state defaulted Transmission shift lever position Propulsion system active Ignition voltage Ignition voltage Transmission fluid temp Transmission fluid temp Hybrid state AutoStop duration min During autostop Engine speed was ********** If above conditions are met then the following must occur: Turbine speed Engine speed Hydraulic pressure delay time If above conditions are met then increment time-out timer. Time-out timer Note: The initial fail	= False = Forward range A = True ≥ 9.00 volts ≤ 31.99 volts ≥ 0.00 °C ≤ 110.00 °C = Engine off ≥ 1.20 seconds ≤ 5.00 rpm ≥ 13.00 rpm ≥ 450.00 rpm **P171D hydraulic ≥ pressure delay** Refer to "Transmission Supporting Tables" for details ≤ 0.38 seconds	≥ 12.00 counts (initial fail count) Frequency =12.5ms Once the above counts are achieved then increment the final fail counter once. The final fail counter can only increment once per autostart event ≥ 3.00 counts (final fail counter) If above counter is greater than threshold then report DTC failed. Frequency = 12.5ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					counter must achieve it's fail threshold in less than the time-out time. ********** If vehicle is launched then: Transmission Ratio Trans Ratio band (1st gr) Trans Ratio band (1st gr) Trans Ratio band (2-6) Trans Ratio band (2-6) Valid transmission ratio achieved time OR If vehicle is not launched but autostart occurs then: Turbine speed Turbine speed less then above threshold for Note: During an autostart event the lack of hydraulic pressure will result in momentary clutch slip in the C1234 clutch. After the clutch slip event, the main transmission pump and clutch will gain capacity, clutch slip will go	**P171D transmission** = **forward gear ratios** Refer to "Transmission Supporting Tables" for details ≤ 1.12 pct ≥ 0.88 pct ≤ 1.07 pct ≥ 0.93 pct ≥ 0.50 seconds ≤ 5.00 rpm ≥ 0.50 seconds		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					to zero. If the vehicle is launching (moving) then a valid transmission ratio can be achieved. Or if the brake is continually applied and an autostart occurs naturally, then no ratio can be measured. In this case turbine speed will return to near zero rpm. ********** DTCs not set	 CrankSensor_FA Transmission Output Shaft Angular Velocity Validity Transmission Turbine Angular Velocity Validity Transmission Oil Temperature Validity P171A P171B P171C U0101 P182E P1915		

Component/ System	Fault Code	Monitor 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 <= 1.24 miles > 20.0 kPa > 1.24 miles	No Active DTCs:	AmbPresSnsrCktFA 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:	> 409.6 seconds EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

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, Gen III)	P2228	Detects a continuous short to low in either the signal circuit or the BARO sensor.	BARO Voltage	< 40.0 % of 5 Volt Range (2.0 Volts = 51.0 kPa)			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, Gen III)	P2229	Detects an open sensor ground, continuous short to high or open in either the signal circuit or the BARO sensor.	BARO Voltage	> 90.0 % of 5 Volt Range (4.5 Volts = 115.1 kPa)			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.
Transmission Control Torque Request Circuit	P2544	Determines if the torque request from the TCM is valid	Protect error - Serial Communication message 2's complement not equal ($189/$199)	Message <> two's complement of message	Diagnostic Status	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 ($189/$199) rolling count index 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	>= 6 range errors out of 10 samples.	
			Range Error - Serial Communication message - ($189/$199) TCM Requested Torque Increase	> 350 Nm	No Serial communication loss to TCM (U0101)	No loss of communication	Performed on every received message	
			OR				>= 3 multi-transitions out of 5 samples. Performed every 200 msec	
			Multi-transition error - Trans torque intervention type request change	Requested torque intervention type toggles from not increasing request to increasing request				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Hood Switch Performance	P257D	This DTC monitors the hood switch rationality	Hood Switch position is in an invalid position. Type of Switch: CeHSWR_e_Enumerated With an enumerated type switch the hood switch reading is invalid in these ranges	1281 Ohms to 1404 Ohms	The diagnostic is enabled Enabled when Run/Crank is active only, otherwise Run/Crank is not used as an enable	= 1 (1 indicates enabled) = 1 (1 indicates Run/ Crank active enabled)	80 failed samples within 100 total samples Diagnostic runs in the 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.
Engine Hood Switch Short to Ground / Low Voltage	P257E	This DTC monitors the hood switch for a short to ground or low voltage condition	Hood Switch position reading is outside an expected bounds for Type of Switch: CeHSWR_e_Enumerated With an enumerated type switch the bound is hood switch reading	<= 325 Ohms	The diagnostic is enabled Enabled when Run/Crank is active only, otherwise Run/Crank is not used as an enable	= 1 (1 indicates enabled) = 1 (1 indicates Run/ Crank active enabled)	80 failed samples within 100 total samples Diagnostic runs in the 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.
Engine Hood Switch Short to Voltage / High Voltage	P257F	This DTC monitors the hood switch for a short to voltage or high voltage condition	Hood Switch position reading is outside an expected bounds for Type of Switch: CeHSWR_e_Enumerated With an enumerated type switch the bound is hood switch reading	>= 3620Ohms	The diagnostic is enabled Enabled when Run/Crank is active only, otherwise Run/Crank is not used as an enable	= 1 (1 indicates enabled) = 1 (1 indicates Run/ Crank active enabled)	80 failed samples within 100 total samples Diagnostic runs in the 12.5 ms loop	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake System Control Module Requested MIL Illumination	P25A2	Monitors the Brake System Control Module MIL request line to determine when the Brake System Control Module has detected a MIL illuminating fault.	Brake System Control Module Emissions-Related DTC set			Time since power-up ≥ 3 seconds	Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake System Control Module B Requested MIL Illumination	P25C9	Monitors the Brake System Control Module B MIL request line to determine when the Brake System Control Module B has detected a MIL illuminating fault.	Brake System Control Module B Emissions-Related DTC set			Time since power-up ≥ 3 seconds	Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
VVT Lock Control Open Ckt Bnk1	P25CA	Diagnoses the VVL park pin system driver circuit for open faults.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Open Circuit: ≤ 200 K Ω impedance between signal and controller ground	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
VVT Lock Control Low Ckt Bnk1	P25CB	Diagnoses the VVL park pin system driver circuit for short to ground 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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
VVT Lock Control Hi Ckt Bnk1	P25CC	Diagnoses the VVL park pin system driver circuit for short to power faults.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Short to power: ≤ 0.5 Ω impedance between signal and controller power	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
VVT Lock Control Open Ckt Bnk2	P25CD	Diagnoses the VVL park pin system driver circuit for open faults.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Open Circuit: ≤ 200 K Ω impedance between signal and controller ground	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
VVT Lock Control Low Ckt Bnk2	P25CE	Diagnoses the VVL park pin system driver circuit for short to ground 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 Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
VVT Lock Control Hi Ckt Bnk2	P25CF	Diagnoses the VVL park pin system driver circuit for short to power faults.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Short to power: ≤ 0.5 Ω impedance between signal and controller power	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Shared High Side Drive #2 Control Circuit Low (STG) - (GEN III Controllers ONLY)	P2670	Diagnoses shared high side driver circuit low voltage	Shared high side drive #2 control circuit low voltage	Controller internal diagnostic	Shared high side drive #2 low diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 0.00 >= 11.00 > 5.00 = ON	20 failures out of 25 samples 100 ms / sample	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Shared High Side Drive #2 Control Circuit High (STP) - (GEN III Controllers ONLY)	P2671	Diagnoses shared high side driver circuit low voltage	Shared high side drive #2 control circuit high voltage	Controller internal diagnostic	Shared high side drive #2 diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 0.00 >= 11.00 > 5.00 = ON	20 failures out of 25 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.
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, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Fuel Pump Control Module	U0109	This DTC monitors for a loss of communication with the fuel pump control module	Message is not received from controller for Message $1EB Message $4D9	 ≥ 12.0 seconds ≥ 12.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 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 > 6.41 Volts = run = 0 (1 indicates enabled) = Active > 11.00 Volts	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 U0109 Fuel Pump 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 Battery Monitor Module	U01B0	This DTC monitors for a loss of communication with the Battery Monitor Module on LIN bus	Message is not received from controller for ECM has lost communication over the LIN bus with Battery Monitor Module for	>= 3 counts	The following criteria have been enabled for Power Mode Run/Crank Voltage	>= 0.38 milliseconds =Run >= 11.00 Volts	Between 100ms and 175ms due to rate of LIN communication to Battery Monitor Module.	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 LIN Bus 3 Off	U1347	This DTC monitors for a LIN bus 3 off condition	LIN bus off failures	>= 3.00 counts	The following criteria have been enabled for Power Mode Run/Crank Voltage	>= 0.38 milliseconds =Run >= 11.00 Volts	Dependent on bus loading.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
LIN Bus 3 Loss of Communication with Stop-Start Control Module (UltraCap)	U135C	This DTC monitors for a loss of communication on the LIN bus 3 with UltraCap Module	ECM has lost communication over the LIN bus 3 with the UltraCap Module for	>= 3.00 counts	The following criteria have been enabled for Power Mode Run/Crank Voltage	>= 0.38 milliseconds =Run >= 11.00 Volts	LIN bus communication executes in 500ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Communication LIN Bus 1 Off	U1501	This DTC monitors for a LIN bus off condition	LIN bus off failures	>= 3.00 counts	The following criteria have been enabled for Power Mode Run/Crank Voltage	>= 0.38 milliseconds =Run >= 11.00 Volts	Dependent on bus loading.	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
LIN Bus 1 Lost Communication with Device 0 (Shutter 1)	U1510	This DTC monitors for a loss of communication on the LIN bus with Shutter 1	ECM has lost communication over the LIN bus with Device 0 / Shutter 1 for	>= 3.00 counts	The following criteria have been enabled for Power Mode Run/Crank Voltage	>= 0.38 milliseconds =Run >= 11.00 Volts	LIN bus communication executes in 500ms loop	Type A, 1 Trips

16 OBDG05 ECM Summary Tables (Unique 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 (OAT wired to IPC)	P0070	Detects an OAT sensor input that has been disconnected from the IPC	OAT sensor transmission from controller reading OAT is invalid		Engine Run Time Ignition Voltage	>= 5.0 seconds >= 11.0 Volts	40 failures out of 50 samples Executed 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.
O2S Circuit Low Voltage Bank 1 Sensor 1 (For use with WRAF - E81	P0131	This DTC determines if the O2 sensor circuit is shorted to low.	B1S1 WRAF ASIC indicates a ground short to any of the following WRAF signals: A) Pump Current - short to ground fail counts are accumulated to determine fault status. B) Reference Cell Voltage - short to ground fail counts are accumulated to determine fault status. C) Reference Ground - short to ground fail counts are accumulated to determine fault status. Note: This ASIC is referred to as ATIC142 (Continental). Note: This DTC will detect a short to ground fault to the Pump Current, Reference Cell Voltage and Reference Ground circuits. Note: A ground short on the Pump Current or Reference Voltage signal may also set a P223C DTC.	The ASIC provides a fault indication when the pump current, reference cell or reference ground pin is < 150mV. Note: the faults must exist for previous 100 milli - seconds to qualify for a fail flag. The three fault signals have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set.	B1S1 DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop WRAF Ref cell temperature ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	P0135, P0030, P0031 or P0032 = Valid = Ready = True > = 600 Deg C = Complete > = 20.0 seconds	Signal A: 128 failures out of 160 samples OR Signal B: 128 failures out of 160 samples OR Signal C: 128 failures out of 160 samples Continuous in 25 milli - second loop	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique 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 Circuit High Voltage Bank 1 Sensor 1 (For use with WRAF - E81	P0132	This DTC determines if the O2 sensor circuit is shorted to high.	B1S1 WRAF ASIC indicates a short to power on any of the following WRAF signals: A) Pump Current - short to power fail counts are accumulated to determine fault status. B) Reference Cell Voltage - short to power fail counts are accumulated to determine fault status. C) Reference Ground - short to power fail counts are accumulated to determine fault status. Note: This ASIC is referred to as ATIC142 (Continental). Note: This DTC will detect a short to power fault to the Pump Current (and Trim circuit), Reference Cell Voltage and Reference Ground circuit.	The ASIC provides a fault indication when the pump current, reference cell or reference ground pin is >= 5.2V. Note: the faults must exist for more than 1 msec to qualify for a fail flag. The three fault signals have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set.	B1S1 DTC's Not active this key cycle Measure Valid Status (ASIC) Controller status (ASIC) Engine Run or Auto stop WRAF Ref cell temperature ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	P0135, P0030, P0031 or P0032 = Valid = Ready = True > = 600 Deg C = Complete > = 20.0 seconds	Signal A: 128 failures out of 160 samples OR Signal B: 128 failures out of 160 samples OR Signal C: 128 failures out of 160 samples Frequency: Continuous in 25 milli - second loop	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique 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 Circuit Low Voltage Bank 2 Sensor 1 (For use with WRAF - E81	P0151	This DTC determines if the O2 sensor circuit is shorted to low.	B2S1 WRAF ASIC indicates a ground short to any of the following WRAF signals: A) Pump Current - short to ground fail counts are accumulated to determine fault status. B) Reference Cell Voltage - short to ground fail counts are accumulated to determine fault status. C) Reference Ground - short to ground fail counts are accumulated to determine fault status. Note: This ASIC is referred to as ATIC142 (Continental). Note: This DTC will detect a short to ground fault to the Pump Current, Reference Cell Voltage and Reference Ground circuits. Note: A ground short on the Pump Current or Reference Voltage signal may also set a P223D DTC.	The ASIC provides a fault indication when the pump current, reference cell or reference ground pin is < 150mV. Note: the faults must exist for more than 83.3us to qualify for a fail flag. The three fault signals have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set.	B2S1 DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop WRAF Ref cell temperature ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	P0155, P0050, P0051 or P0052 = Valid = Ready = True > = 600 Deg C = Complete > = 20.0 seconds	Signal A: 128 failures out of 160 samples OR Signal B: 128 failures out of 160 samples OR Signal C: 128 failures out of 160 samples Continuous in 25 milli - second loop	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique 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 Circuit High Voltage Bank 2 Sensor 1 (For use with WRAF - E81	P0152	This DTC determines if the O2 sensor circuit is shorted to high.	B2S1 WRAF ASIC indicates a short to power on any of the following WRAF signals: A) Pump Current - short to power fail counts are accumulated to determine fault status. B) Reference Cell Voltage - short to power fail counts are accumulated to determine fault status. C) Reference Ground - short to power fail counts are accumulated to determine fault status. <u>Note</u>: This ASIC is referred to as ATIC142 (Continental). <u>Note</u>: This DTC will detect a short to power fault to the Pump Current (and Trim circuit), Reference Cell Voltage and Reference Ground circuit.	The ASIC provides a fault indication when the pump current, reference cell or reference ground pin is >= 5.2V. Note: the faults must exist for more than 83.3us to qualify for a fail flag. The three fault signals have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set.	B2S1 DTC's Not active this key cycle Measure Valid Status (ASIC) Controller status (ASIC) Engine Run or Auto stop WRAF Ref cell temperature ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) **********	P0155, P0050, P0051 or P0052 = Valid = Ready = True > = 600 Deg C = Complete > = 20.0 seconds	Signal A: 128 failures out of 160 samples OR Signal B: 128 failures out of 160 samples OR Signal C: 128 failures out of 160 samples Frequency: Continuous in 25 milli - second loop	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique 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 Delayed Response Rich to Lean Bank 1 Sensor 1) (For use with WRAF	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. The EWMA caluclation uses a 0.25 coefficient. OR [The Accumulated time monitored during the R2L Delayed Response Test (Gross failure). AND Pre O2 sensor EQR is	> 0.7 EWMA (sec) >= 2.0 Seconds > 1.000 EQR	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, P013A, P013B, P013E, P013F, P2270, P2271 > 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**	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.
						and **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations: B1S1, B2S1 (if applicable) in Supporting Tables tab.		
					O2 Heater (pre sensor) on for	>= 30 seconds		
					(Engine Coolant Or OBD Coolant Enable Criteria	> 55 ºC = TRUE)		
					IAT	> -40 ºC		
					Engine run Accum	> 30 seconds		
					Engine Speed to initially enable test	1,150 <= RPM <= 2,500		
					Engine Speed range to keep test enabled (after initially enabled)	1,100 <= RPM <= 2,550		
					Engine Airflow	2 <= gps <= 12		
					Vehicle Speed to initially enable test	42.3 <= MPH <= 80.2		
					Vehicle Speed range to keep test enabled (after initially enabled)	38.5 <= MPH <= 82.0		
					Closed loop integral	0.87 <= C/L Int <= 1.07		
					Closed Loop Active	= TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		
					Evap	not in control of purge		
					Ethanol	not in estimate mode		
					Baro	> 70 kpa		
					Post fuel cell	= enabled		
					EGR Intrusive diagnostic	= not active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp Fuel State ========== All of the above met for at least 3.0 seconds, and then the Force Cat Rich intrusive stage is requested. ========== Pre O2S EQR 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).	= not active >= 60.0 sec 500 <= ºC <= 980 = DFCO possible ========== ========== >= 1.100 EQR = DFCO active <= 5 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) (For use with WRAF	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. The EWMA caluclation uses a 0.25 coefficient. OR [The Accumulated time monitored during the L2R Delayed Response Test (Gross failure). AND Pre O2 sensor EQR is OR At end of Cat Rich stage the Pre O2 sensor output is	> 0.7 EWMA (sec) >= 2.0 Seconds < 1.000 EQR < 1.100 EQR	No Active DTC's P015A test is complete and 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, P013A, P013B, P013E, P013F, P015A, P2270, P2271 = Passed > 10.0 Volts = Not active = Not active = Not active = Not active = False = Not Valid, See definition of	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.
						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) in Supporting Tables tab.		
					O2 Heater (pre sensor) on for	>= 30 seconds		
					(Engine Coolant Or OBD Coolant Enable Criteria	> 55 ºC		
					IAT Engine run Accum	= TRUE) > -40 ºC > 30 seconds		
					Engine Speed to initially enable test			
					Engine Speed range to keep test enabled (after initially enabled)	1,150 <= RPM <= 2,500 1,100 <= RPM <= 2,550		
					Engine Airflow Vehicle Speed to initially enable test	2 <= gps <= 12		
					Vehicle Speed range to keep test enabled (after initially enabled)	42.3 <= MPH <= 80.2 38.5 <= MPH <= 82.0		
					Closed loop integral Closed Loop Active	0.87 <= C/L Int <= 1.07 = TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		
					Evap Ethanol	not in control of purge		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Baro Post fuel cell EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp 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 :	not in estimate mode > 70 kpa = enabled = not active = not active >= 60.0 sec 500 <= ºC <= 980 = DFCO inhibit >= 1 cylinders ========== ========== 0 <= gps <= 13 <= 0.8 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) (For use with WRAF	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. The EWMA caluclation uses a 0.25 coefficient. OR [The Accumulated time monitored during the R2L Delayed Response Test (Gross failure). AND Pre O2 sensor EQR is above	> 0.7 EWMA (sec) >= 2.0 Seconds >KaESPD_eqr_R2L_DelayRespThrshWRAFEQR	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 P0151, P0152, P013C, P013D, P014A, P014B, P2272, P2273 > 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**	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.
						and **Multiple DTC Use_Green Sensor Delay Criteria - Limit** for the following locations: B1S1, B2S1 in Supporting Tables tab.		
					O2 Heater (pre sensor) on for	>= 30 seconds		
					(Engine Coolant Or OBD Coolant Enable Criteria	> 55 ºC = TRUE)		
					IAT	> -40 ºC		
					Engine run Accum	> 30 seconds		
					Engine Speed to initially enable test	1,150 <= RPM <= 2,500		
					Engine Speed range to keep test enabled (after initially enabled)	1,100 <= RPM <= 2,550		
					Engine Airflow	2 <= gps <= 12		
					Vehicle Speed to initially enable test	42.3 <= MPH <= 80.2		
					Vehicle Speed range to keep test enabled (after initially enabled)	38.5 <= MPH <= 82.0		
					Closed loop integral	0.87 <= C/L Int <= 1.07		
					Closed Loop Active	= TRUE (Please see "**Closed Loop Enable Clarification**" in Supporting Tables).		
					Evap	not in control of purge		
					Ethanol	not in estimate mode		
					Baro	> 70 kpa		
					Post fuel cell	= enabled		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					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 3.0 seconds, and then the Force Cat Rich intrusive stage is requested. ========== Pre O2S EQR 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).	= not active = not active >= 60.0 sec 500 <= ºC <= 980 = DFCO possible ========== ========== >= 1.100 EQR = DFCO active <= 5 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) (For use with WRAF	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. The EWMA caluclation uses a 0.25 coefficient. OR [The Accumulated time monitored during the L2R Delayed Response Test (Gross failure). AND Pre O2 sensor EQR is below OR At end of Cat Rich stage the Pre O2 sensor EQR is	> 0.7 EWMA (sec) >= 2.0 Seconds < 1.000 EQR < 1.100 EQR	No Active DTC's P015C test is complete and 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 P0151, P0152, P013C, P013D, P014A, P014B, P015C, P2272, P2273 = Passed > 10.0 Volts = Not active = Not active = Not active = Not active = False = Not Valid, See definition of	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.
						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 Tables tab.		
					O2 Heater (pre sensor) on for	>= 30 seconds		
					(Engine Coolant Or OBD Coolant Enable Criteria	> 55 ºC		
					IAT	= TRUE)		
					Engine run Accum	> -40 ºC > 30 seconds		
					Engine Speed to initially enable test			
					Engine Speed range to keep test enabled (after initially enabled)	1,150 <= RPM <= 2,500		
						1,100 <= RPM <= 2,550		
					Engine Airflow			
					Vehicle Speed to initially enable test	2 <= gps <= 12		
					Vehicle Speed range to keep test enabled (after initially enabled)	42.3 <= MPH <= 80.2		
						38.5 <= MPH <= 82.0		
					Closed loop integral			
					Closed Loop Active	0.87 <= C/L Int <= 1.07 = TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		
					Evap	not in control of purge		
					Ethanol	not in estimate mode		
					Baro			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Post fuel cell EGR Intrusive diagnostic All post sensor heater delays O2S Heater (post sensor) on Time Predicted Catalyst temp 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 :	> 70 kpa = enabled = not active = not active >= 60.0 sec 500 <= ºC <= 980 = DFCO inhibit >= 1 cylinders ========== ========== 0 <= gps <= 13 <= 0.8 gps		

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Active Grill Air Shutter B Performance /Stuck OFF	P05AE	Compare commanded shutter B position to sensed position	Consecutive failed intrusive position performance test count	>= 5.00	1. Ignition Run_Crack Active, 2. Ignition Run_Crank AND Ignition Accessory AND ECU Awake, 3. Command Shutter1 Enable	1. = TRUE, 2. = FALSE AND = FALSE AND = TRUE, 3. = TRUE	1 sample / 100 millisec	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module O2 Sensor Processor Performance Bank 1) (For use with WRAF	P064D	Diagnoses the WRAF internal control module for faults.	B1S1 WRAF ASIC indicates control module faults	Controller Status fail counts and Measure Valid fail counts are accumulated to determine fault status	Engine Run or Auto stop Heater Warm-up delay WRAF circuit diagnostic delay since power up	= True = Complete > = 20.0 sec	128 controller status fail counts out of 160 samples OR 128 measure valid fail counts out of 160 samples 25 ms / sample Continuous	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module O2 Sensor Processor Performance Bank 2) (For use with WRAF	P064E	Diagnoses the WRAF internal control module for faults.	B2S1 WRAF ASIC indicates control module faults	Controller Status fail counts and Measure Valid fail counts are accumulated to determine fault status	Engine Run or Auto stop Heater Warm-up delay WRAF circuit diagnostic delay since power up	= True = Complete > = 20.0 sec	128 controller status fail counts out of 160 samples OR 128 measure valid fail counts out of 160 samples 25 ms / sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Communication Error with Active Grill Air Shutter Module “B”	P151F	This DTC monitors for an internal error or error in communication with the Active Grill Air Shutter Module B	Communication of the Alive Rolling Count from the Shutter Module over LIN bus is incorrect or the Shutter Module signals it has an internal error for out of total samples	>= 10.00 counts >= 10.00 counts	All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	>= 3.00 seconds = Run >= 11.00 Volts >= 11.00 Volts	LIN bus communication executes in 500ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DC/DC Converter Actuator Voltage Signal Message Counter Incorrect	P155E	This DTC monitors for an error in communication with the DC/DC Converter Actuator Voltage Signal	Communication of the Alive Rolling Count or Protection Value from the DC/DC Converter over CAN bus is incorrect for out of total samples	>= 10 counts >= 10 counts	All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	>= 3.00 seconds = Run >= 11.00 Volts >= 11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DC/DC Converter Performance Signal Message Counter Incorrect	P155F	This DTC monitors for an error in communication with the DC/DC Converter Internal Health Signal	Communication of the Alive Rolling Count or Protection Value from the DC/DC Converter over CAN bus is incorrect for out of total samples	>= 10 counts >= 10 counts	All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	>= 3.00 seconds = Run >= 11.00 Volts >= 11.00 Volts	Executes in 25ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DC/DC Converter Ignition Switch Run/ Start Position Signal Message Counter Incorrect	P156D	This DTC monitors for an error in communication with the DC/DC Converter Run/ Crank Terminal Status Signal	Communication of the Alive Rolling Count or Protection Value from the DC/DC Converter over CAN bus is incorrect for out of total samples	>= 10 counts >= 10 counts	All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	>= 3.00 seconds = Run >= 11.00 Volts >= 11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DC/DC Converter Crank Control Signal Message Counter Incorrect	P156E	This DTC monitors for an error in communication with the DC/DC Converter Crank Control Terminal Signal	Communication of the Alive Rolling Count or Protection Value from the DC/DC Converter over CAN bus is incorrect for out of total samples	>= 10 counts >= 10 counts	All the following conditions are met for Power Mode Powertrain Relay Voltage Run/Crank Ignition Voltage	>= 3.00 seconds = Run >= 11.00 Volts >= 11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Ignition Voltage Correlation #3	P16BC	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the Powertrain Relay Ignition Voltage #2	|Run/Crank – PT Relay Ignition| >	3.00 Volts		Powertrain commanded on AND (Run/Crank voltage > Table, f(IAT). See supporting tables: **P1682_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 0.175 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.
O2 Sensor Pumping Current Performance Bank 1 (For use with WRAF - E81	P223C	This DTC determines if the O2 sensor pumping current has an incorrect or out of range value	Fault condition present when the pump current is in any of the fault regions when this test is enabled during DFCO. Note: This ASIC is referred to as ATIC142 (Continental).	The three pump current fault regions are: A) Pump current > 5.00 ma B) Pump current <= 0.30 ma and >= - 0.30 ma C) Pump current < -0.10 ma The three fault regions have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set. Note: This DTC will detect open circuit faults to the Pump current, Ref Cell voltage and Ref Ground circuits.	B1S1 DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) ********** WRAF Ref cell temperature Test starts when time in DFCO Test stops when time in DFCO	P0135, P0030, P0031 or P0032 = Valid = Ready = True = Complete > = 20.0 seconds >= 600 Deg C >= 5.0 seconds > 12.0 seconds	Region A: 40 failures out of 160 samples OR Region B: 40 failures out of 160 samples OR Region C: 40 failures out of 160 samples Sample rate is 25 msec. Test enabled during DFCO.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Pumping Current Performance Bank 2 (For use with WRAF - E81	P223D	This DTC determines if the O2 sensor pumping current has an incorrect or out of range value	Fault condition present when the pump current is in any of the fault regions when this test is enabled during DFCO. Note: This ASIC is referred to as ATIC142 (Continental).	The three pump current fault regions are: A) Pump current > 5.00 ma B) Pump current <= 0.30 ma and >= - 0.30 ma C) Pump current < -0.10 ma The three fault regions have individual X out of Y calibrations. When the X out of Y is reached in any region this DTC is set. Note: This DTC will detect open circuit faults to the Pump current, Ref Cell voltage and Ref Ground circuits.	B2S1 DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) ********** WRAF Ref cell temperature Test starts when time in DFCO Test stops when time in DFCO	P0155, P0050, P0051 or P0052 = Valid = Ready = True = Complete > = 20.0 seconds >= 600 Deg C >= 5.0 seconds > 12.0 seconds	Region A: 40 failures out of 160 samples OR Region B: 40 failures out of 160 samples OR Region C: 40 failures out of 160 samples Sample rate is 25 msec. Test enabled during DFCO.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Reference Resistance Out Of Range Bank 1	P223E	This DTC determines if the O2 sensor reference cell has an incorrect or out of range resistance value.	Measured Reference cell temperature	< 700 Deg C OR > 1,000.0 Deg C	B1S1 DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) Then Delay after WRAF circuit diagnostic delay **********	P0135, P0030, P0031 or P0032 = Valid = Ready = True = Complete >= 20.0 seconds >= 10.0 seconds	128 failures out of 160 samples Sample rate is 25 msec Continuous	Type B, 2 Trips

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Reference Resistance Out Of Range Bank 2	P223F	This DTC determines if the O2 sensor reference cell has an incorrect or out of range resistance value.	Measured Reference cell temperature	< 700 Deg C OR > 1,000.0 Deg C	B2S1 DTC's Not active this key cycle Measure Valid status (ASIC) Controller status (ASIC) Engine Run or Auto stop ********** Heater Warm-up delay Then WRAF circuit diagnostic delay (since heater Warm-up delay is complete) Then Delay after WRAF circuit diagnostic delay **********	P0155, P0050, P0051 or P0052 = Valid = Ready = True = Complete >= 20.0 seconds >= 10.0 seconds	128 failures out of 160 samples Sample rate is 25 msec Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger Boost Pressure Too High - Mechanical Turbocharger with wastegate. Not supercharger with mechanical compressor	P226B	Detect Too High Boost Pressure	Pressure ratio over the compressor	< rever to **P226B_KtBSTD_r_ExcsvBstPresLim** in supporting tables	Diagnostic Enabled Engine Speed No Active DTCs:	True >= 9,999 rpm MAF_SensorFA BSTR_b_BoostSnsrFA AmbientAirDefault	13 failures out of 25 samples 25ms / sample	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 active	Current MAP Model 2 Error AND (All Cylinder MAP Model 2 Error) - (Current MAP Model 2 Error) Where: Current MAP Model 2 Error = (Measured MAP – MAP Model 2) Filtered Where: All Cylinder MAP Model 2 Error = (Measured MAP – MAP Model 2) Filtered stored the last time that all cylinders were active for a time greater than	< -4 kPa > -4 kPa > 2.0 seconds	**ReducedEngineCapacityMode_Enable** = TRUE for a time Engine Speed Engine Speed (Coolant Temp OR OBD Coolant Enable Criteria Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) See Residual Weight Factor tables. No Active DTCs: No Pending DTCs:	 > 2.0 seconds >= 425 RPM <= 6,500 RPM >= -7 Deg C = TRUE) <= 150 Deg C >= -20 Deg C <= 125 Deg C >= 0.50 MAP Model 2 Error multiplied by **P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM** MAP_SensorCircuitFA EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA IAT_SensorFA EGRValve_FP ECT_Sensor_Ckt_FP IAT_SensorCircuitFP	100 failures out of 200 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.
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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3403 may also set (Cylinder 1 Deactivation Solenoid Control Circuit/ Low)

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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3401 may also set (Cylinder 1 Deactivation Solenoid Control Circuit/ Open)

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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 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 2 Deactivation Solenoid Control Circuit/Open	P3409	Diagnoses cylinder 2 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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3411 may also set (Cylinder 2 Deactivation Solenoid Control Circuit/ Low)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Deactivation Solenoid Control Circuit/Low	P3411	Diagnoses cylinder 2 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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3409 may also set (Cylinder 2 Deactivation Solenoid Control Circuit/ Open)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Deactivation Solenoid Control Circuit/High	P3412	Diagnoses cylinder 2 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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 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/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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3419 may also set (Cylinder 3 Deactivation Solenoid Control Circuit/ Low)

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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3417 may also set (Cylinder 3 Deactivation Solenoid Control Circuit/ Open)

16 OBDG05 ECM Summary Tables (Unique DTCs)

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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3427 may also set (Cylinder 4 Deactivation Solenoid Control Circuit/ Low)

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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3425 may also set (Cylinder 4 Deactivation Solenoid Control Circuit/ Open)

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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 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 5 Deactivation Solenoid Control Circuit/Open	P3433	Diagnoses cylinder 5 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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3435 may also set (Cylinder 5 Deactivation Solenoid Control Circuit/ Low)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 5 Deactivation Solenoid Control Circuit/Low	P3435	Diagnoses cylinder 5 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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3433 may also set (Cylinder 5 Deactivation Solenoid Control Circuit/ Open)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 5 Deactivation Solenoid Control Circuit/High	P3436	Diagnoses cylinder 5 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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3443 may also set (Cylinder 6 Deactivation Solenoid Control Circuit/ Low)

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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 rpm	>= 20 errors out of 25 samples Performed every 250 msec	Type B, 2 Trips Note: In certain controllers P3441 may also set (Cylinder 6 Deactivation Solenoid Control Circuit/ Open)

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 Status Powertrain Relay Voltage Engine RPM	Enabled ≥ 11.00 volts ≥ 425 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.
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: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 5.0000 seconds 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 > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts > 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.
					U012A CHCM A	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.
Coolant Temperature Dropped Below Diagnostic Monitoring Temperature	P01F0	This DTC detects an unexplained system cool down below the OBD monitoring threshold during normal operating conditions	Engine coolant temperature	≤ 70.0 Deg C	No Active DTC's	ECT_Sensor_Ckt_FA VehicleSpeedSensor_FA OAT_PtEstFiltFA THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA EngineTorqueEstInaccurate ECT_Sensor_Perf_FA THMR_SWP_NoFlow_FA THMR_SWP_FlowStuckOn_FA	30 failures out of 60 samples 1 sample / second Continuous	Type A, 1 Trips
					Engine Runtime	≥ 0.0 seconds		
					Distance traveled this key cycle	≥ 2.0 km		
					Ambient air pressure	≥ 55.0 kPa		
					Ambient air temperature	≥ -7.0 Deg C		
					Engine coolant temperature At least once during the key cycle	≥ 71 Deg C		
					Heat to coolant	≥ 5.0 kW		
					DFCO time	≤ 0.0 seconds		
					Thermostat duty cycle	≤ 20.0 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine coolant temperature	≤ 78.5 Deg C	No Active DTC's	ECT_Sensor_Ckt_FA VehicleSpeedSensor_FA OAT_PtEstFiltFA THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA EngineTorqueEstInaccurate ECT_Sensor_Perf_FA THMR_SWP_NoFlow_FA THMR_SWP_FlowStuckOn_FA	30 failures out of 60 samples 1 sample / second Continuous	
					Engine Runtime	≥ 0.0 seconds		
					Distance traveled this key cycle	≥ 2.0 km		
					Ambient air pressure	≥ 55.0 kPa		
					Ambient air temperature	≥ -7.0 Deg C		
					Engine coolant temperature At least once during the key cycle depending on coolant request	≥ 79.5 to 94.5 Deg C		
					Heat to coolant	≥ 5.0 kW		
					DFCO time	≤ 0.0 seconds		
					Thermostat duty cycle	≤ 20.0 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #5 Circuit	P06D2	Detects a continuous or intermittent short on the 5 volt reference circuit #5	ECM Vref5 < or ECM Vref5 > or the difference between ECM filtered Vref5 and Vref5 >	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

16 OBDG05 ECM Summary Tables (Unique DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SENT Fuel Rail High Pressure Sensor 2 Out of Range Low	P127C (New)	This DTC Diagnoses High Pressure Sensor 2 Out of Range Low						

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	 ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds ≥ 12.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 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 > 6.41 Volts = run = 0 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips "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.
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 325 mvolts and 575 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 FuelPressureSensorCircuitFA FuelInjectorCircuit_FA AIR System FA Ethanol Composition Sensor FA EngineMisfireDetected_FA P0131, P0132, P0134 10.0 < Volts < 32.0 = Not active = Not active = Not active = Not active = False = Not Valid, See definition of **Multiple DTC Use_Green Sensor Delay Criteria - Airflow** and **Multiple DTC Use_Green Sensor Delay Criteria - Limit**	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.
						for the following locations: B1S1, B2S1 in Supporting Tables tab.		
					O2 Heater on for Learned Htr resistance	≥ 60 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Engine Coolant	> 54 ºC		
					IAT	> -40 ºC		
					Engine run Accum	> 30 seconds		
					Time since any AFM status change	> 0.0 seconds		
					Time since Purge On to Off change	> 4.0 seconds		
					Time since Purge Off to On change	> 4.0 seconds		
					Engine airflow	15 ≤ grams/second ≤ 43		
					Engine speed	1,000 <= RPM <= 3,000		
					Fuel Condition	< 87 % Ethanol		
					Baro	> 70 kpa		
					Air Per Cylinder	≥ 125 mGrams		
					Fuel Control State	= Closed Loop		
					Closed Loop Active	= TRUE (Please see "**Closed Loop Enable Clarification**" in Supporting Tables).		
					LTM (Block Learn) fuel cell	= Enabled, refer to **Multiple DTC Use - Response Cell Enable Table**		
					Transient Fuel Mass	≤ 100.0 mgrams		
					Baro	= Not Defaulted		
					Fuel Control State	not = Power Enrichment		
					Fuel State	DFCO not active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Commanded Proportional Gain ========== All of the above met for	≥ 0.0 % ========== > 2.0 seconds		

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 325 mvolts and 575 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 FuelPressureSensorCircuitFA FuelInjectorCircuit_FA AIR System FA Ethanol Composition Sensor FA EngineMisfireDetected_FA = P0151, P0152 or P0154 10.0 < Volts < 32.0 = Not active = Not active = Not active = Not active = False = Not Valid, See definition of **Multiple DTC Use_Green Sensor Delay Criteria - Airflow** and **Multiple DTC Use_Green Sensor Delay Criteria - Limit**	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.
						for the following locations: B1S1, B2S1 in Supporting Tables tab.		
					O2 Heater on for Learned Htr resistance	≥ 60 seconds = Valid (the heater resistance has learned since NVM reset, see enable conditions for "HO2S Heater Resistance DTC's")		
					Engine Coolant	> 54 ºC		
					IAT	> -40 ºC		
					Engine run Accum	> 30 seconds		
					Time since any AFM status change	> 0.0 seconds		
					Time since Purge On to Off change	> 4.0 seconds		
					Time since Purge Off to On change	> 4.0 seconds		
					Engine airflow	15 ≤ grams/second ≤ 43		
					Engine speed	1,000 ≤ RPM ≤ 3,000		
					Fuel Condition	< 87 % Ethanol		
					Baro	> 70 kpa		
					Air Per Cylinder	>= 125 mGrams		
					Fuel Control State	= Closed Loop		
					Closed Loop Active	= TRUE (Please see "**Closed Loop Enable Clarification**" in Supporting Tables).		
					LTM (Block Learn) fuel cell	= Enabled, refer to **Multiple DTC Use - Response Cell Enable Table**		
					Transient Fuel Mass	≤ 100.0 mgrams		
					Baro	= Not Defaulted		
					Fuel Control State	not = Power Enrichment		
					Fuel State	DFCO not active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Commanded Proportional Gain ========== All of the above met for	≥ 0.0 % ========== > 2.0 seconds		

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

16 OBDG05 ECM Summary Tables (Unique DTCs)

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	<= 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

16 OBDG05 ECM Summary Tables (Unique DTCs)

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	>= 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

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 2 Relay Control Circuit Open (ODM)	P0481	Diagnoses the cooling fan 2 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 P0693 may also set (Fan 2 Short to Ground)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 2 Relay Control Circuit Low Voltage (ODM)	P0693	Diagnoses cooling fan 2 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 P0481 may also set (Fan 2 Open Circuit).

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 2 Relay Control Circuit High Voltage (ODM)	P0694	Diagnoses the cooling fan 2 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

16 OBDG05 ECM Summary Tables (Unique DTCs)

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.
O2S Circuit Low Voltage Bank 1 Sensor 2) (For Single Bank Exhaust Only	P0137	This DTC determines if the O2 sensor circuit is shorted to low.	Oxygen Sensor Signal	< 40 mvolts	No Active DTC's	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	320 failures out of 400 samples Frequency: Continuous in 100 milli - second loop	Type B, 2 Trips
					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	= Not active = Not active = Not active = Not active 10.0 < Volts = Not active = Not active = Not active = Not active = False 0.9805 <= ratio <= 1.0996 50 <= mgrams <= 500 = Closed Loop = TRUE (Please see “**Closed Loop Enable Clarification**” in Supporting Tables).		
					All Fuel Injectors for active Cylinders Fuel Condition Fuel State	Enabled (On) Ethanol <= 87 %DFCO not active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					All of the above met for	> 3.0 seconds		

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 Single 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 > 1.2	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: 2 tests per trip 10 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.
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	240.0 ≤ N-M ≤ 8,191.8 20 ≤ % ≤ 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.
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 ≥ 2.400 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 -7.0 ≤ 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.
Transfer Case Control Module Transfer Case Command State Rationality - 4wd high command not 4wd high ratio	P279A	Monitor measures transfer case gear ratio is 4wd low ratio or neutral ratio while the transfer case control module command state is 4wd high.	measured transfer case ratio is 4wd high ratio AND measured transfer case ratio calculation updated (measured transfer case ratio = transmission output speed / transfer case output speed)	= FALSE = TRUE	transfer case contol module transfer case command state weighted fail count measured transfer case ratio is 4wd high ratio set to TRUE AND measured tranfer case ratio calculation updated set to TRUE transfer case output speed sensor configuration = CeFWDD_e_UseTCSS	= 4wd high = **P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)** (see supproting table) measured transfer case ratio >= **P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)** (see supporting table) AND measured transfer case ratio <= **P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)** (see supporting table) transfer case output speed sensor configuration = CeFWDD_e_UseTCSS = FALSE	weighted fail count >= 5 out of sample count >= 280 (12.5 milleseconds per count)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P0502 fault active AND P0503 fault active AND P0722 fault active AND P0723 fault active AND P2160 fault active AND P2616 fault active vehicle drive wheel type configuration NOT CeFWDG_e_No_AWD_Or_FWD AND NOT CeFWDG_e_Versatrak_AWD AND NOT CeFWDG_e_FWD_AWD_SingleSpd	= FALSE = FALSE = FALSE = FALSE = FALSE vehicle drive wheel type configuration = CeFWDR_e_FWD_ECM_TCM_TCCM		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Control Module Transfer Case Command State Rationality - 4wd low command not 4wd low ratio	P279B	Monitor measures transfer case gear ratio is 4wd high ratio or neutral ratio while the transfer case control module command state is 4wd low.	measured transfer case ratio is 4wd low ratio AND measured transfer case ratio calculation updated (measured transfer case ratio = transmission output speed / transfer case output speed)	= FALSE = TRUE	transfer case contol module transfer case command state weighted fail count measured transfer case ratio is 4wd low ratio set to TRUE AND measured tranfer case ratio calculation updated set to TRUE transfer case output speed sensor configuration = CeFWDD_e_UseTCSS	= 4wd low = **P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)** (see supproting table) measured transfer case ratio >= **P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)** (see supporting table) AND measured transfer case ratio <= **P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)** (see supporting table) transfer case output speed sensor configuration = CeFWDD_e_UseTCSS = FALSE	weighted fail count >= 5 out of sample count >= 280 (12.5 milleseconds per count)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P0502 fault active AND P0503 fault active AND P0722 fault active AND P0723 fault active AND P2160 fault active AND P2616 fault active vehicle drive wheel type configuration NOT CeFWDG_e_No_AWD_Or_FWD AND NOT CeFWDG_e_Versatrak_AWD AND NOT CeFWDG_e_FWD_AWD_SingleSpd	= FALSE = FALSE = FALSE = FALSE = FALSE vehicle drive wheel type configuration = CeFWDR_e_FWD_ECM_TCM_TCCM		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Control Module Transfer Case Command State Rationality - 4wd neutral command not 4wd neutral ratio	P279C	Monitor measures transfer case gear ratio is 4wd high ratio or 4wd low ratio while the transfer case control module command state is 4wd neutral.	measured transfer case ratio is 4wd neutral ratio AND measured transfer case ratio calculation updated (measured transfer case ratio = transmission output speed / transfer case output speed)	= FALSE = TRUE	transfer case contol module transfer case command state weighted fail count measured transfer case ratio is 4wd neutral ratio set to TRUE AND measured tranfer case ratio calculation updated set to TRUE when ratio check 1 AND ratio check 2	= 4wd neutral = **P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)** (see supproting table) ratio check 1: measured transfer case ratio >= **P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 1)** (see supporting table) OR measured transfer case ratio <= **P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 1)** ratio check 2 measured transfer case ratio >=	weighted fail count >= 5 out of sample count >= 280 (12.5 milleseconds per count)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					transfer case output speed sensor configuration = CeFWDD_e_UseTCSS P0502 fault active AND P0503 fault active AND P0722 fault active AND P0723 fault active AND P2160 fault active AND P2616 fault active vehicle drive wheel type configuration NOT CeFWDG_e_No_AWD_Or_FWD AND NOT CeFWDG_e_Versatrak_AWD AND NOT CeFWDG_e_FWD_AWD_SingleSpd	**P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 2)** (see supporting table) OR measured transfer case ratio <= **P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 2)** transfer case output speed sensor configuration = CeFWDD_e_UseTCSS = FALSE = FALSE = FALSE = FALSE = FALSE vehicle drive wheel type configuration = CeFWDR_e_FWD_ECM_TCM_TCCM		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					neutral rationality enabled	= 1		

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	 ≥ 12.0 seconds ≥ 12.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycle DiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 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 > 6.41 Volts = run = 0 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type C, No SVS

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		

Engine run time greater than
Closed Loop Enable Clarification - KtFSTA_t_ClosedLoopAutostart **(HYBRID ONLY)**
KtFSTA_t_ClosedLoopAutostart

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
Closed Loop Enable Clarification - KtFSTA_t_ClosedLoopTime
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
Closed Loop Enable Clarification - KfFCLP_U_O2ReadyThrshLo
KfFULC_U_O2_SensorReadyThrsh Lo (Switching Sensor)

Voltage < *XXXX* milliVolts

for
Closed Loop Enable Clarification - KcFULC_O2_SensorReadyEvents
KcFULC_O2_SensorReadyEvents (Switching Sensor)

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

or
Closed Loop Enable Clarification - KeWRSC_T_HtrCntrlCL
KeWRSC_T_HtrCntrlCL (WRAF Sensor)
and
Closed Loop Enable Clarification - KeWRSI_T_PumpCurrentEnable
KeWRSI_T_PumpCurrentEnable (WRAF Sensor)
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
CylDeacSystemTFTKO
O2S_Bank_ 1_TFTKO, O2S_Bank_ 2_TFTKO, FuelInjectorCircuit_FA and CylnderDeacDriverTFTKO = False

Long Term FT Enable Criteria

Closed Loop Enable and
Coolant greater than
Closed Loop Enable Clarification - KfFCLL_T_AdaptiveLoCoolant
KfFCLL_T_AdaptiveLoCoolant

Coolant	> *XXXX*Celcius

or less than
Closed Loop Enable Clarification - KfFCLL_T_AdaptiveHiCoolant
KfFCLL_T_AdaptiveHiCoolant

Coolant	< *XXXX*Celcius

and
Closed Loop Enable Clarification - KtFCLL_p_AdaptiveLowMAP_Limit
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
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
Closed Loop Enable Clarification - KfFCLP_U_O2ReadyThrshLo
KfFCLP_U_O2ReadyThrshLo

Voltage	< *XXXX* milliVolts

for
Closed Loop Enable Clarification - KcFCLP_Cnt_O2RdyCyclesThrsh
KcFCLP_Cnt_O2RdyCyclesThrsh

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

Long Term Secondary Fuel Trim Enable Criteria

Closed Loop Enable Clarification - KtFCLP_t_PostIntglDisableTime
KtFCLP_t_PostIntglDisableTime

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
Closed Loop Enable Clarification - KtFCLP_t_PostIntglRampInTime
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

Closed Loop Enable Clarification - KeFCLP_T_IntegrationCatalystMax

KeFCLP_T_IntegrationCatalystMax

Modeled Catalyst Temperature < *XXXX*Celcius

and

Closed Loop Enable Clarification - KeFCLP_T_IntegrationCatalystMin

KeFCLP_T_IntegrationCatalystMin

Modeled Catalyst Temperature > *XXXX*Celcius

and

PO2S_Bank_1_Snsr_2_FA

PO2S_Bank_1_Snsr_2_FA and

PO2S_Bank_2_Snsr_2_FA

PO2S_Bank_2_Snsr_2_FA = False

and

Closed Loop Enable Clarification - KeFCLP_Pct_CatAccuSlphrPostDsbl

(KeFCLP_Pct_CatAccuSlphrPostDsbl

Modeled converter sulfur percent < XXXX Percent

and

Closed Loop Enable Clarification - KaFCLP_U_SlphrIntglOfst_Thrsh

Post Integral < KaFCLP_U_SlphrIntglOfst_Thrsh

X axis: Post O2 Sensor

Y axis: Post O2 Mode

Z: Post Integral threshold

and

Closed Loop Enable Clarification - KeFCLP_dm_IntegrationAirflowMax

Airflow < KeFCLP_dm_IntegrationAirflowMax

OBD Coolant enable
Starting in 11.15A software GM has created a coordinated signal within the ECM that serves as a master enable for diagnostics/controls that use coolant as an enable condition. Controls and diagnostics may choose to enable prior to this calculated signal, but calibrating beyond the OBD limit will not function because of this signal. This enable condition is also put on the CAN bus for other modules to consume as well.

KeTHMG_b_elecstatequipd = 0 for this application

For mechanical thermostat applications (KeTHMG_b_elecstatequipd = 0)
OBD Coolant Enable Temp = P0128 Primary target temp – Calibratable offset (0-32) – 1
OBD Coolant Enable Temp = 71 - 0.0 – 1
OBD Coolant Enable Temp = 70.0

For E-stat applications (KeTHMG_b_elecstatequipd = 1)

OBD Coolant Enable Temp = Max(Min(ECT Control Temp) – Primary Warm up delta, Min primary P0128 target) – Calibratable offset (0-32) – 1
OBD Coolant Enable Temp = Max(Min(KaTHMC_T_TMS_EngCoolReq) - KaECTR_T_CTR_WrmUpDeltaTemp[0], KaECTR_T_CTR_WrmUpTargetMin[0]) - KeECTR_T_CTR_GlblMinOffst – 1
OBD Coolant Enable Temp = Max(90.5 - 11 , 71) - 0.0 – 1
OBD Coolant Enable Temp = 80.5

****

Exhaust Cam Phsr Enable

Exhaust Cam Phsr Enable = TRUE if:

DTCs not set:
CrankSensor_TFTKO
CamSnsrExhTFTKO
CamLctnExhFA

AND

CamSensorAnyLocationFAdiagnostic has executed and passed

AND

Cam edge locations have been learned

AND

[**Intake Cam Phsr Enable** = TRUE
OR
Intake Park Position is Retarded (TRUE)]

AND

[Catalyst Warmup Enabled = TRUE
AND
Engine RPM > 900.00
AND
Engine Run Time > **P0011_P0021_P05CC_P05CD_P0014_P0024_P05CE_P05CF_ColdStartEngRunning** sec]

OR

[Engine is running and engine power is requested

AND
ExhEngineSpeed is Enabled (see below)
AND
ExhOilPressure is Enabled (see below)
AND
ExhEngineOilTemp is Enabled (see below)]

****

ExhEngineSpeed is Enabled when

P0014_P0024_P05CE_P05CF_LoRpmHiEnblEc < Engine RPM <**P0014_P0024_P05CE_P05CF_HiEngSpdLoEnblEc**

ExhEngineSpeed is Disabled when

Engine RPM < **P0014_P0024_P05CE_P05CF_LoRpmLoDsblEc**
OR
Engine RPM > **P0014_P0024_P05CE_P05CF_HiEngSpdHiDsblEc**

****

If an oil pressure sensor is present (TRUE) and is being used (FALSE) then

ExhOilPressureEnable is Enabled when
Oil Pressure > **P0014_P0024_P05CE_P05CF_LoPresHiEnblEc** kPa
for **P0014_P0024_P05CE_P05CF_EngOilPressEnblEc** seconds

ExhOilPressureEnable is Disabled when
Oil pressure < **P0014_P0024_P05CE_P05CF_LoPresLoDsblEc** kPa

If an oil pressure sensor is not present (FALSE) OR is not being used (TRUE) then

ExhOilPressureEnable is Enabled when
Engine RPM > **P0014_P0024_P05CE_P05CF_LoRpmHiEnblEc**
for **P0014_P0024_P05CE_P05CF_EngOilPressEnblEc** seconds

****

ExhEngineOilTemp is Enabled when

-10.00 < Engine Oil Temp < 150.00 deg C

ExhEngineOilTemp is Disabled when
Engine Oil Temp < -13.00 deg C
OR
Engine Oil Temp > 155.00 deg C

****
****

Intake Cam Phsr Enable

Intake Cam Phsr Enable = TRUE if:

DTCs not set:
CrankSensor_TFTKO
CamSnsrIntTFTKO
CamLctnIntFA

AND

CamSensorAnyLocationFA has executed and passed

AND

Cam edge locations have been learned

AND

[Catalyst Warmup Enabled = TRUE
AND
Engine RPM > 900.00
AND
Engine Run Time > **P0011_P0021_P05CC_P05CD_P0014_P0024_P05CE_P05CF_ColdStartEngRunning** sec]

OR

[Engine is running and engine power is requested
AND
IntEngineSpeed is Enabled
AND
IntOilPressure is Enabled
AND
IntEngineOilTemp is Enabled]

****

IntEngineSpeed is Enabled when
P0011_P0021_P05CC_P05CD_LoRpmHiEnblIc < Engine RPM < **P0011_P0021_P05CC_P05CD_HiEngSpdLoEnblIc**

IntEngineSpeed is Disabled when

Engine RPM < **P0011_P0021_P05CC_P05CD_LoRpmLoDsblIc**
OR
Engine RPM > **P0011_P0021_P05CC_P05CD_HiEngSpdHiDsblIc**

****

If an oil pressure sensor is present (TRUE) and is being used (FALSE) then

IntOilPressureEnable is Enabled when
Oil Pressure > **P0011_P0021_P05CC_P05CD_LoPresHiEnblIc** kPa
for **P0011_P0021_P05CC_P05CD_EngOilPressEnblIc** seconds

IntOilPressureEnable is Disabled when
Oil pressure < **P0011_P0021_P05CC_P05CD_LoPresLoDsblIc**

If an oil pressure sensor is not present (FALSE) or is not being used (TRUE) then

IntOilPressureEnable is Enabled when
Engine RPM > **P0011_P0021_P05CC_P05CD_LoRpmHiEnblIc**
for **P0011_P0021_P05CC_P05CD_EngOilPressEnblIc** seconds

****

IntEngineOilTemp is Enabled when

-25.00 < Engine Oil Temp < 150.00 deg C

IntEngineOilTemp is Disabled when
Engine Oil Temp < -27.00 deg C
OR
Engine Oil Temp > 155.00 deg C

****
****

ReducedEngineCapacityMode_Enable

REDUCED CAPACITY CONTROL ENABLE CONDITIONS:
Conditions below must be met for >= 1.5 seconds before cylinder deactivation will begin in regular mode

Neutral Idle Mode (NI) operational checks:
Allowed in NI (FALSE)
Time NI mode shall be active >= 1.0 seconds
Vehicle Speed for NI
< 4.3 mph to Enter
> 0.0 mph to Exit
PRNDL position in NI = False **VCE_PRNDL_NI_Disables** (For details see Supporting Tables)
Engine RPM lower limit for NI > 475 rpm
Transmission gear for NI = FALSE **VCE_TransGear_DisablesNI**(For details see Supporting Tables)
Torque based AFM entry conditions: NI Mode Active
Indicated Torque < **VCE_NormalMode_MaxTorque_Gr5** minus 10.0 Nm
(Function of Gear: VCE_NormalMode_MaxTorque_Gr1 - Gr8,for details see Supporting Tables)

Normal Mode operational checks:
Engine running (based on engine off time)
Maximum of 30.0 or > **VCE_StartUpDelayTime** seconds (For details see Supporting Tables)
Engine RPM
> **VCE_EngineRPM_LowerLmt** + 50 RPM AND
< **VCE_EngineRPM_UpperLmt** - 200 RPM (For details see Supporting Tables)
Vehicle Speed (in Gear) >= 11.8 mph
Vehicle Speed (P/N) <= 0.0 mph
Vehicle Speed based on PRNDL < **VCE_VehicleSpeed_PRNDL_Enable**

Engine RPM PRNDL Feature is FALSE (When TRUE, will enable AFM only if transmission is not in a defaulted state)
Engine coolant (deac) >= 210 and <= 122 deg C
Ignition voltage >= 11.0 volts
Engine Oil Temperature >= 25 and <= 125 deg C
Engine Oil Pressure >= 23 and <= 97 KPa
Oil pump intrusive test = FALSE (refer to P06DD and P06DE)
Oil aeration present: Aeration enabled by engine RPM > 5,000 for 15 second(s), disabled by engine RPM < 4,000 for 90 second(s)
Catalyst Warmup Enabled= FALSE
POPD: Not active
Deceleration Fuel Cut Off: Not active
Fuel shut off (FSO) delay: Not active >= 5 second(s)
Green Engine mode: Not active
Pedal Position < 45 pct
Brake booster vacuum >= 0 KPa
Transmission gear = FALSE **VCE_TransGear_Disables**(For details see Supporting Tables)
Gear Shift: not currently in progress
4WD State: not = 4 low range
Time since last AFM mode event >= 1 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 < 85 % 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 perforamance mode

Torque based AFM entry conditions:

ECO Mode Active: Indicated Torque < **VCE_ECOMode_MaxTorque_Gr5** minus **VCE_ECOMode_EnableTorqueHyst**
(Function of Gear: VCE_ECOMode_MaxTorque_Gr1 - Gr8, For details see Supporting Tables)

Normal Mode: Indicated Torque < **VCE_NormalMode_MaxTorque_Gr5** minus **VCE_NormalMode_EnableTorqueHyst**
(Function of Gear: VCE_NormalMode_MaxTorque_Gr1 - Gr8, For details see Supporting Tables)

<u>IF DEACTIVATED, ANY OF THE CONDITIONS BELOW WILL FORCE CYLINDER REACTIVATION:</u>
If deactivation mode is active for >= 480 seconds

then reactivation will occur if: >= 600 seconds
Deac mode active or
Delta vacuum > 10 or < 10 kPa
Vehicle Speed for NI exit < 0 Kph
ETC Power management mode: Active
Converter overtemp protect: Active
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: Active (see P2270-P2273, P013A-P014B)

Torque based AFM exit conditions:
ECO Mode Active: Indicated Torque < **VCE_ECOMode_MaxTorque_Gr5**
(Function of Gear: VCE_ECOMode_MaxTorque_Gr1 - Gr8, For details see Supporting Tables)

Normal Mode: Indicated Torque < **VCE_NormalMode_MaxTorque_Gr5**
(Function of Gear: VCE_NormalMode_MaxTorque_Gr1 - Gr8, For details see Supporting Tables)

Engine Vacuum: **VCE_MinVacReducedTorqMode** (For details see Supporting Tables)
Ignition voltage < 10 volts
Engine coolant < 200 or > 132 Deg C
Vehicle speed < 9.3 mph
Brake booster vacuum < 0 kPa
Engine oil temperature < 20 or > 130 Deg C
Pedal Position > 50 %
Piston Protection: Active

No active DTC's for control enable:
Fault Bundles:
Catalyst Warmup Enabled
EngOilPressureSensorFA
EnginePowerLimited
CrankSensor_TFTKO

EngineTorqueEstInaccurate
VehicleSpeedSensorError
ECT_Sensor_FA
BrakeBoosterVacuumValid
IAT_SensorFA
CylDeacDriverFault
CylDeacAllDriverFault
MAP_EngineVacuumStatus
PowertrainRelayFault
CamSensorAnyLctnTFTKO
OilPmpStuckHigh
VCER_TorqueSecurity
FourWheelDriveLowStateInvalid

DFCO Enable Conditions

COOLANT ENABLE CRITERIA

Coolant temperature < **DFCO_CoolEnblHi_Temp** °C See Supporting Table

RUN TIME ENEBALE CRIETRIA

Engine run time > **DFCO_DelayAfterStart_Time** seconds See Supporting Table

ENGINE SPEED ENABLE CRITERIA

TORQUE CONVERETR CLUTCH UNLOCK

POPD OFF:

i) enabled when engine speed > (950.0 + supporting table value **DFCO_EngSpdEnblOfst**)

ii) once enabled continue to be enabled until engine speed < (850.0 + supporting table value **DFCO_EngSpdEnblOfst**)

POPD ON:

i) enabled when engine speed > (950.0 + supporting table value **DFCO_EngSpdEnblOfst**)

ii) once enabled continue to be enabled until engine speed < (850.0 + supporting table value **DFCO_EngSpdEnblOfst**)

TORQUE CONVERETR CLUTCH LOCK

POPD OFF:

i) enabled when engine speed > (950.0 + supporting table value **DFCO_EngSpdEnblOfst**)

ii) once enabled continue to be enabled until engine speed < (850.0 + supporting table value **DFCO_EngSpdEnblOfst**)

POPD ON:

i) enabled when engine speed > (950.0 + supporting table value **DFCO_EngSpdEnblOfst**)

ii) once enabled continue to be enabled until engine speed < (850.0 + supporting table value **DFCO_EngSpdEnblOfst**)

VEHICLE SPEED CRITERIA:

i) enabled when vehicle speed >= (**DFCO_EnblHi_Vehicle_Speed**)

ii) once enabled continue to be enabled until vehicle speed < **DFCO_DsblLo_Vehicle_Speed**

TORQUE CRITERIA :

I) enabled when following AND conditions satisfied

(a) driver raw trq delta = raw toqrue - zero pedal torque <= 65,535.0

b) driver shaped trq delta1 = shaped immediate torque - zero pedal torque <= 1.0

c) driver shaped trq delta2 = shaped predicted torque - minimum combustion unmanaged torque = 65,535.0

d) driver shaped trq delta3 = shaped immediate torque - minimum combustion managed torque <= 65,535.0

ii) once enabled, disabled when following OR conditions are satisfied

a) driver raw trq delta1 = raw torque - zero pedal torque > 5.0

b) driver shaped trq delta2 = zero pedal torque - minimum combustion managed torque > 65,535.0

CATALYST TEMPERATURE

i) enabled based on following AND criteria

a) (CatTemp < 970.0 °C and vehicle speed < 50.0 kph)

b) CatTemp < 1,000.0 °C

c) CatTemp >= -40.0 °C

d) CatalystWarmupEnabled = FALSE
ii) once enabled, disabled when following OR conditions are met
OTHER CONDITIONS:
a) Transmission is not about to unlock
b) Engine not about to stall
c) Transmission is not shifting if already not in DFCO
d) POPD or EOSD
1) POPD requesting DFCO or neither requesting DFCO OFF nor inhibit DFCO
2) EOSD not active
e) EVAP does not inhibit DFCO
f) O2 response test is not inhibiting DFCO event
g) Throttle is not in default mode

Initial Supporting table - Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests

Description: KaPOPD_PostCellEnbl - A table of adaptive (Block Learn) cells in which to enable the post oxygen sensor tests.

Notes: Note: When Table column headings match the calibration value below it, that indivdual cell is enabled.

Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 1				
y/x	0	1	2	3
1	7	7	7	7
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 2				
y/x	4	5	6	7
1	7	7	7	7
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 3				
y/x	8	9	10	11
1	15	15	15	15
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 4				
y/x	12	13	14	15
1	15	15	15	15

Initial Supporting table - Multiple DTC Use - Response Cell Enable Table

Description: KaEOSD_RespCellEnbl - Block Learn cell in which to enable the Oxygen Sensor Response test

Notes: Note: When Table column headings match the calibration value below it, that individual cell is enabled

Multiple DTC Use - Response Cell Enable Table - Part 1				
y/x	CeFADR_e_Cell00_PurgOnAirMode 5	CeFADR_e_Cell01_PurgOnAirMode 4	CeFADR_e_Cell02_PurgOnAirMode 3	CeFADR_e_Cell03_PurgOnAirMode 2
1	CeFADR_e_Cell00_PurgOnAirMode 5	CeFADR_e_Cell01_PurgOnAirMode 4	CeFADR_e_Cell02_PurgOnAirMode 3	CeFADR_e_Cell03_PurgOnAirMode 2
Multiple DTC Use - Response Cell Enable Table - Part 2				
y/x	CeFADR_e_Cell04_PurgOnAirMode 1	CeFADR_e_Cell05_PurgOnAirMode 0	CeFADR_e_Cell06_PurgOnIdle	CeFADR_e_Cell07_PurgOnDecel
1	CeFADR_e_Cell04_PurgOnAirMode 1	CeFADR_e_Cell05_PurgOnAirMode 0	CeFADR_e_Cell00_PurgOnAirMode 5	CeFADR_e_Cell07_PurgOnDecel
Multiple DTC Use - Response Cell Enable Table - Part 3				
y/x	CeFADR_e_Cell08_PurgOffAirMode 5	CeFADR_e_Cell09_PurgOffAirMode 4	CeFADR_e_Cell10_PurgOffAirMode 3	CeFADR_e_Cell11_PurgOffAirMode 2
1	CeFADR_e_Cell08_PurgOffAirMode 5	CeFADR_e_Cell09_PurgOffAirMode 4	CeFADR_e_Cell10_PurgOffAirMode 3	CeFADR_e_Cell11_PurgOffAirMode 2
Multiple DTC Use - Response Cell Enable Table - Part 4				
y/x	CeFADR_e_Cell12_PurgOffAirMode 1	CeFADR_e_Cell13_PurgOffAirMode 0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
1	CeFADR_e_Cell12_PurgOffAirMode 1	CeFADR_e_Cell13_PurgOffAirMode 0	CeFADR_e_Cell00_PurgOnAirMode 5	CeFADR_e_Cell15_PurgOffDecel

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

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

Initial 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

Initial 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	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Initial Supporting table - P0011_P0021_P05CC_P05CD_EngOilPressEnblIc

Description: Delay time before the oil pressure enable flag is set assuming all the oil pressure enable criteria are met

Notes: KtPHSC_t_EngOilPressEnblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Initial Supporting table - P0011_P0021_P05CC_P05CD_HiEngSpdHiDsbllc

Description: Intake cam is disabled when engine speed exceeds this value

Notes: KtPHSC_n_HiEngSpdHiDsbllc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000

Initial Supporting table - P0011_P0021_P05CC_P05CD_HiEngSpdLoEnblIc

Description: Intake cam is enabled when engine speed remains below this value

Notes: KtPHSC_n_HiEngSpdLoEnblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800

Initial Supporting table - P0011_P0021_P05CC_P05CD_LoPresHiEnbllc

Description: Intake cam is enabled when oil pressure exceeds this value

Notes: KtPHSC_p_LoPresHiEnblEc

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

Initial Supporting table - P0011_P0021_P05CC_P05CD_LoPresLoDsbllc

Description: Intake cam is disabled when oil pressure falls below this value

Notes: KtPHSC_p_LoPresLoDsbllc

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

Initial Supporting table - P0011_P0021_P05CC_P05CD_LoRpmHiEnbllc

Description: Intake cam is enabled when engine speed exceeds this value.

Notes: KtPHSC_n_LoRpmHiEnblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Initial Supporting table - P0011_P0021_P05CC_P05CD_LoRpmLoDsbllc

Description: Intake cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsbllc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900

Initial Supporting table - P0011_P0021_P05CC_P05CD_P0014_P0024_P05CE_P05CF_ColdStartEngRunning

Description: Engine running time must be greater than this threshold during a cold start to enable cam phasing

Notes: KtPHSR_t_ColdStartEngRunning

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	30	15	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2

Initial Supporting table - P0011_P05CC_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	1.0	1.0	1.0	1.0	1.0	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
1,200	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
1,600	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
2,000	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
2,400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2,800	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
3,200	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
3,600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4,000	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
4,400	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
4,800	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
5,200	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
5,600	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
6,000	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
6,400	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
6,800	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

Initial Supporting table - P0014_CamPosErrorLimEc1

Description: P0014 - Cam Position Error Limit for performance diagnostic

Notes: KtPHSD_phi_CamPosErrorLimEc1

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Initial Supporting table - P0014_P0024_P05CE_P05CF_EngOilPressEnblEc

Description: Delay time before the oil pressure enable flag is set assuming all the oil pressure enable criteria are met

Notes: KtPHSC_t_EngOilPressEnblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Initial Supporting table - P0014_P0024_P05CE_P05CF_HiEngSpdHiDsblEc

Description: Exhaust cam is disabled when engine speed exceeds this value

Notes: KtPHSC_n_HiEngSpdHiDsblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000

Initial Supporting table - P0014_P0024_P05CE_P05CF_HiEngSpdLoEnblEc

Description: Exhaust cam is enabled when engine speed remains below this value

Notes: KtPHSC_n_HiEngSpdLoEnblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800

Initial Supporting table - P0014_P0024_P05CE_P05CF_LoPresHiEnblEc

Description: Exhaust cam is enabled when oil pressure exceeds this value

Notes: KtPHSC_p_LoPresHiEnblIc

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

Initial Supporting table - P0014_P0024_P05CE_P05CF_LoPresLoDsblEc

Description: Exhaust cam is disabled when oil pressure falls below this value

Notes: KtPHSC_p_LoPresLoDsblEc

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

Initial Supporting table - P0014_P0024_P05CE_P05CF_LoRpmHiEnblEc

Description: Exhaust cam is enabled when engine speed exceeds this value.

Notes: KtPHSC_n_LoRpmHiEnblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Initial Supporting table - P0014_P0024_P05CE_P05CF_LoRpmLoDsblEc

Description: Exhaust cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900

Initial Supporting table - P0014_P05CE_StablePositionTimeEc1

Description: P0014 - Delay after transient move

Notes: KtPHSD_t_StablePositionTimeEc1

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
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
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
1,200	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
1,600	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
2,000	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
2,400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2,800	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
3,200	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
3,600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4,000	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
4,400	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
4,800	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
5,200	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
5,600	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
6,000	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
6,400	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
6,800	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

Initial Supporting table - P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold

Description: P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold

Notes: KtPHSC_t_RtnHomeDlyLmt

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	300	300	160	18	18	18	18	10	3	3	3	3	3	3	3	3	3

Initial Supporting table - P0021_CamPosErrorLimIc2

Description: P0021 - Cam Position Error Limit for performance diagnostic

Notes: KtPHSD_phi_CamPosErrorLimIc2

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Initial Supporting table - P0021_P05CD_StablePositionTimeIc2

Description: P0021 - Delay after transient move

Notes: KtPHSD_t_StablePositionTimeIc2

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
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
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
1,200	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
1,600	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
2,000	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
2,400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2,800	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
3,200	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
3,600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4,000	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
4,400	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
4,800	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
5,200	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
5,600	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
6,000	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
6,400	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
6,800	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

Initial Supporting table - P0024_CamPosErrorLimEc2

Description: P0024 - Cam Position Error Limit for performance diagnostic

Notes: KtPHSD_phi_CamPosErrorLimEc2

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5,200	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5,600	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,000	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,400	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6,800	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Initial Supporting table - P0024_P05CF_StablePositionTimeEc2

Description: P0024 - Delay after transient move

Notes: KtPHSD_t_StablePositionTimeEc2

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
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
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
1,200	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
1,600	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
2,000	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
2,400	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2,800	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
3,200	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
3,600	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4,000	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
4,400	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
4,800	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
5,200	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
5,600	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
6,000	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
6,400	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
6,800	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

Initial Supporting table - P0071: OAT Performance Drive Equilibrium Engine Off

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

Notes:

y/x	0.0	5.0	10.0	15.0	20.0	25.0	30.0	50.0	80.0
1.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0

Initial Supporting table - P0071: OAT Performance Drive Equilibrium Engine Running

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

Notes:

y/x	0.0	5.0	10.0	15.0	20.0	25.0	30.0	50.0	80.0
1.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
5.0	-5.0	-2.0	-1.0	0.0	1.0	2.0	3.0	4.0	5.0
10.0	-4.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0
20.0	-2.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0
30.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0
40.0	0.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0
50.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
60.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
70.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0

Initial Supporting table - P00C4_P2261_KtBSTD_r_SurgeLim

Description: Turbo compressor bypass valve diagnosis surge area limit.

Notes:

y/x	0.00	10.00	21.00	53.00	95.00	129.00
1	0.925	1.114	1.323	1.941	2.624	3.157

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

Description: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

Notes: This table describes combinations of individual model failures that will set P0101, P0106, P010B, P0121, P0236 and P1101 on turbocharged applications.

y/x	1	2	3	4	5	6	7	8	9
1	MAF Model	MAP1 Model	MAP2 Model	MAP3 Model	TIAP1 Model	TPS Model	TIAP Correlation	TIAP Correlation	DTC Set
2	Failed	Failed	Failed	Failed	Failed	Failed	Failed	Valid	
3	F	F	F	F	F	F	F	F	No DTC
4	F	F	F	F	F	F	F	T	No DTC
5	F	F	F	F	F	F	T	F	No DTC
6	F	F	F	F	F	F	T	T	No DTC
7	F	F	F	F	F	T	F	F	No DTC
8	F	F	F	F	F	T	F	T	No DTC
9	F	F	F	F	F	T	T	F	No DTC
10	F	F	F	F	F	T	T	T	No DTC
11	F	F	F	F	T	F	F	F	No DTC
12	F	F	F	F	T	F	F	T	No DTC
13	F	F	F	F	T	F	T	F	No DTC
14	F	F	F	F	T	F	T	T	No DTC
15	F	F	F	F	T	T	F	F	P1101
16	F	F	F	F	T	T	F	T	P0121
17	F	F	F	F	T	T	T	F	P1101
18	F	F	F	F	T	T	T	T	P0236
19	F	F	F	T	F	F	F	F	P1101
20	F	F	F	T	F	F	F	T	P1101
21	F	F	F	T	F	F	T	F	P1101
22	F	F	F	T	F	F	T	T	P1101
23	F	F	F	T	F	T	F	F	P1101
24	F	F	F	T	F	T	F	T	P1101
25	F	F	F	T	F	T	T	F	P1101
26	F	F	F	T	F	T	T	T	P1101
27	F	F	F	T	T	F	F	F	P1101
28	F	F	F	T	T	F	F	T	P1101
29	F	F	F	T	T	F	T	F	P1101
30	F	F	F	T	T	F	T	T	P1101
31	F	F	F	T	T	T	F	F	P1101
32	F	F	F	T	T	T	F	T	P1101
33	F	F	F	T	T	T	T	F	P1101
34	F	F	F	T	T	T	T	T	P1101

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

35	F	F	T	F	F	F	F	F	P1101
36	F	F	T	F	F	F	F	T	P1101
37	F	F	T	F	F	F	T	F	P1101
38	F	F	T	F	F	F	T	T	P1101
39	F	F	T	F	F	T	F	F	P1101
40	F	F	T	F	F	T	F	T	P1101
41	F	F	T	F	F	T	T	F	P1101
42	F	F	T	F	F	T	T	T	P1101
43	F	F	T	F	T	F	F	F	P1101
44	F	F	T	F	T	F	F	T	P1101
45	F	F	T	F	T	F	T	F	P1101
46	F	F	T	F	T	F	T	T	P1101
47	F	F	T	F	T	T	F	F	P1101
48	F	F	T	F	T	T	F	T	P1101
49	F	F	T	F	T	T	T	F	P1101
50	F	F	T	F	T	T	T	T	P1101
51	F	F	T	T	F	F	F	F	P1101
52	F	F	T	T	F	F	F	T	P1101
53	F	F	T	T	F	F	T	F	P1101
54	F	F	T	T	F	F	T	T	P1101
55	F	F	T	T	F	T	F	F	P1101
56	F	F	T	T	F	T	F	T	P1101
57	F	F	T	T	F	T	T	F	P1101
58	F	F	T	T	F	T	T	T	P1101
59	F	F	T	T	T	F	F	F	No DTC
60	F	F	T	T	T	F	F	T	No DTC
61	F	F	T	T	T	F	T	F	No DTC
62	F	F	T	T	T	F	T	T	No DTC
63	F	F	T	T	T	T	F	F	P1101
64	F	F	T	T	T	T	F	T	P1101
65	F	F	T	T	T	T	T	F	P1101
66	F	F	T	T	T	T	T	T	P1101
67	F	T	F	F	F	F	F	F	P1101
68	F	T	F	F	F	F	F	T	P1101
69	F	T	F	F	F	F	T	F	P1101
70	F	T	F	F	F	F	T	T	P0236
71	F	T	F	F	F	T	F	F	P1101
72	F	T	F	F	F	T	F	T	P0121

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

73	F	T	F	F	F	T	T	F	P1101
74	F	T	F	F	F	T	T	T	P0236
75	F	T	F	F	T	F	F	F	P1101
76	F	T	F	F	T	F	F	T	P1101
77	F	T	F	F	T	F	T	F	P1101
78	F	T	F	F	T	F	T	T	P0236
79	F	T	F	F	T	T	F	F	P1101
80	F	T	F	F	T	T	F	T	P0121
81	F	T	F	F	T	T	T	F	P1101
82	F	T	F	F	T	T	T	T	P0236
83	F	T	F	T	F	F	F	F	P1101
84	F	T	F	T	F	F	F	T	P1101
85	F	T	F	T	F	F	T	F	P1101
86	F	T	F	T	F	F	T	T	P1101
87	F	T	F	T	F	T	F	F	P1101
88	F	T	F	T	F	T	F	T	P1101
89	F	T	F	T	F	T	T	F	P1101
90	F	T	F	T	F	T	T	T	P1101
91	F	T	F	T	T	F	F	F	P1101
92	F	T	F	T	T	F	F	T	P1101
93	F	T	F	T	T	F	T	F	P1101
94	F	T	F	T	T	F	T	T	P1101
95	F	T	F	T	T	T	F	F	P1101
96	F	T	F	T	T	T	F	T	P1101
97	F	T	F	T	T	T	T	F	P1101
98	F	T	F	T	T	T	T	T	P1101
99	F	T	T	F	F	F	F	F	P1101
100	F	T	T	F	F	F	F	T	P1101
101	F	T	T	F	F	F	T	F	P1101
102	F	T	T	F	F	F	T	T	P1101
103	F	T	T	F	F	T	F	F	P1101
104	F	T	T	F	F	T	F	T	P1101
105	F	T	T	F	F	T	T	F	P1101
106	F	T	T	F	F	T	T	T	P1101
107	F	T	T	F	T	F	F	F	P1101
108	F	T	T	F	T	F	F	T	P1101
109	F	T	T	F	T	F	T	F	P1101
110	F	T	T	F	T	F	T	T	P1101

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

111	F	T	T	F	T	T	F	F	P1101
112	F	T	T	F	T	T	F	T	P1101
113	F	T	T	F	T	T	T	F	P1101
114	F	T	T	F	T	T	T	T	P1101
115	F	T	T	T	F	F	F	F	P0106
116	F	T	T	T	F	F	F	T	P0106
117	F	T	T	T	F	F	T	F	P0106
118	F	T	T	T	F	F	T	T	P0106
119	F	T	T	T	F	T	F	F	P1101
120	F	T	T	T	F	T	F	T	P1101
121	F	T	T	T	F	T	T	F	P1101
122	F	T	T	T	F	T	T	T	P1101
123	F	T	T	T	T	F	F	F	P1101
124	F	T	T	T	T	F	F	T	P1101
125	F	T	T	T	T	F	T	F	P1101
126	F	T	T	T	T	F	T	T	P1101
127	F	T	T	T	T	T	F	F	P1101
128	F	T	T	T	T	T	F	T	P1101
129	F	T	T	T	T	T	T	F	P1101
130	F	T	T	T	T	T	T	T	P1101
131	T	F	F	F	F	F	F	F	P1101
132	T	F	F	F	F	F	F	T	P1101
133	T	F	F	F	F	F	T	F	P1101
134	T	F	F	F	F	F	T	T	P0236
135	T	F	F	F	F	T	F	F	P1101
136	T	F	F	F	F	T	F	T	P0121
137	T	F	F	F	F	T	T	F	P1101
138	T	F	F	F	F	T	T	T	P0236
139	T	F	F	F	T	F	F	F	P1101
140	T	F	F	F	T	F	F	T	P1101
141	T	F	F	F	T	F	T	F	P1101
142	T	F	F	F	T	F	T	T	P0236
143	T	F	F	F	T	T	F	F	P1101
144	T	F	F	F	T	T	F	T	P0121
145	T	F	F	F	T	T	T	F	P1101
146	T	F	F	F	T	T	T	T	P0236
147	T	F	F	T	F	F	F	F	P1101
148	T	F	F	T	F	F	F	T	P1101

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

149	T	F	F	T	F	F	T	F	P1101
150	T	F	F	T	F	F	T	T	P1101
151	T	F	F	T	F	T	F	F	P1101
152	T	F	F	T	F	T	F	T	P1101
153	T	F	F	T	F	T	T	F	P1101
154	T	F	F	T	F	T	T	T	P1101
155	T	F	F	T	T	F	F	F	P1101
156	T	F	F	T	T	F	F	T	P1101
157	T	F	F	T	T	F	T	F	P1101
158	T	F	F	T	T	F	T	T	P1101
159	T	F	F	T	T	T	F	F	P1101
160	T	F	F	T	T	T	F	T	P1101
161	T	F	F	T	T	T	T	F	P1101
162	T	F	F	T	T	T	T	T	P1101
163	T	F	T	F	F	F	F	F	P1101
164	T	F	T	F	F	F	F	T	P1101
165	T	F	T	F	F	F	T	F	P1101
166	T	F	T	F	F	F	T	T	P1101
167	T	F	T	F	F	T	F	F	P1101
168	T	F	T	F	F	T	F	T	P1101
169	T	F	T	F	F	T	T	F	P1101
170	T	F	T	F	F	T	T	T	P1101
171	T	F	T	F	T	F	F	F	P1101
172	T	F	T	F	T	F	F	T	P1101
173	T	F	T	F	T	F	T	F	P1101
174	T	F	T	F	T	F	T	T	P1101
175	T	F	T	F	T	T	F	F	P1101
176	T	F	T	F	T	T	F	T	P1101
177	T	F	T	F	T	T	T	F	P1101
178	T	F	T	F	T	T	T	T	P1101
179	T	F	T	T	F	F	F	F	P1101
180	T	F	T	T	F	F	F	T	P1101
181	T	F	T	T	F	F	T	F	P1101
182	T	F	T	T	F	F	T	T	P1101
183	T	F	T	T	F	T	F	F	P1101
184	T	F	T	T	F	T	F	T	P1101
185	T	F	T	T	F	T	T	F	P1101
186	T	F	T	T	F	T	T	T	P1101

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

187	T	F	T	T	T	F	F	F	P0101 or P010B
188	T	F	T	T	T	F	F	T	P0101 or P010B
189	T	F	T	T	T	F	T	F	P0101 or P010B
190	T	F	T	T	T	F	T	T	P0101 or P010B
191	T	F	T	T	T	T	F	F	P1101
192	T	F	T	T	T	T	F	T	P1101
193	T	F	T	T	T	T	T	F	P1101
194	T	F	T	T	T	T	T	T	P1101
195	T	T	F	F	F	F	F	F	P1101
196	T	T	F	F	F	F	F	T	P1101
197	T	T	F	F	F	F	T	F	P1101
198	T	T	F	F	F	F	T	T	P0236
199	T	T	F	F	F	T	F	F	P1101
200	T	T	F	F	F	T	F	T	P0121
201	T	T	F	F	F	T	T	F	P1101
202	T	T	F	F	F	T	T	T	P0236
203	T	T	F	F	T	F	F	F	P1101
204	T	T	F	F	T	F	F	T	P1101
205	T	T	F	F	T	F	T	F	P1101
206	T	T	F	F	T	F	T	T	P0236
207	T	T	F	F	T	T	F	F	P1101
208	T	T	F	F	T	T	F	T	P0121
209	T	T	F	F	T	T	T	F	P1101
210	T	T	F	F	T	T	T	T	P0236
211	T	T	F	T	F	F	F	F	P1101
212	T	T	F	T	F	F	F	T	P1101
213	T	T	F	T	F	F	T	F	P1101
214	T	T	F	T	F	F	T	T	P1101
215	T	T	F	T	F	T	F	F	P1101
216	T	T	F	T	F	T	F	T	P1101
217	T	T	F	T	F	T	T	F	P1101
218	T	T	F	T	F	T	T	T	P1101
219	T	T	F	T	T	F	F	F	P1101
220	T	T	F	T	T	F	F	T	P1101
221	T	T	F	T	T	F	T	F	P1101
222	T	T	F	T	T	F	T	T	P1101
223	T	T	F	T	T	T	F	F	P1101
224	T	T	F	T	T	T	F	T	P1101

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: Turbocharger Intake Flow Rationality Diagnostic Failure Matrix

225	T	T	F	T	T	T	T	F	P1101
226	T	T	F	T	T	T	T	T	P1101
227	T	T	T	F	F	F	F	F	P1101
228	T	T	T	F	F	F	F	T	P1101
229	T	T	T	F	F	F	T	F	P1101
230	T	T	T	F	F	F	T	T	P1101
231	T	T	T	F	F	T	F	F	P1101
232	T	T	T	F	F	T	F	T	P1101
233	T	T	T	F	F	T	T	F	P1101
234	T	T	T	F	F	T	T	T	P1101
235	T	T	T	F	T	F	F	F	P1101
236	T	T	T	F	T	F	F	T	P1101
237	T	T	T	F	T	F	T	F	P1101
238	T	T	T	F	T	F	T	T	P1101
239	T	T	T	F	T	T	F	F	P1101
240	T	T	T	F	T	T	F	T	P1101
241	T	T	T	F	T	T	T	F	P1101
242	T	T	T	F	T	T	T	T	P1101
243	T	T	T	T	F	F	F	F	P1101
244	T	T	T	T	F	F	F	T	P1101
245	T	T	T	T	F	F	T	F	P1101
246	T	T	T	T	F	F	T	T	P1101
247	T	T	T	T	F	T	F	F	P1101
248	T	T	T	T	F	T	F	T	P1101
249	T	T	T	T	F	T	T	F	P1101
250	T	T	T	T	F	T	T	T	P1101
251	T	T	T	T	T	F	F	F	P1101
252	T	T	T	T	T	F	F	T	P1101
253	T	T	T	T	T	F	T	F	P1101
254	T	T	T	T	T	F	T	T	P1101
255	T	T	T	T	T	T	F	F	P1101
256	T	T	T	T	T	T	F	T	P1101
257	T	T	T	T	T	T	T	F	P1101
258	T	T	T	T	T	T	T	T	P1101

Initial Supporting table - 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	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.698

Initial Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: MAP2 Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAP2 Residual Weight Factor based on RPM

Notes:

y/x	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.864	1.000	1.000	1.000	1.000	1.000	1.000	0.662

Initial Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAP3 Residual Weight Factor based on RPM

Notes:

y/x	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.814	0.974	1.000	0.925	1.000	0.971	0.600	1.000

Initial Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: TPS Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 TPS Residual Weight Factor based on RPM

Notes:

y/x	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.905	1.000	1.000	1.000	0.909	1.000	1.000	0.750	0.540

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P0236_P1101 TIAP Residual Weight Factor based on RPM

Notes:

y/x	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max Air Flow

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	20.0	25.0	28.0	30.0	32.0	31.0	30.0	30.0	30.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max MAP

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	95.0	80.0	70.0	45.0	38.0	35.0	30.0	30.0	30.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Offset

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min Air Flow

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	18.0	65.0	115.0	130.0	150.0	165.0	175.0	175.0	175.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min MAP

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	95.0	120.0	130.0	155.0	170.0	160.0	160.0	162.0	170.0

Initial Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Offset

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	1.0	1.0	1.0	1.0	2.0	2.4	4.0	5.0	5.0

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

Description: KaEOSD_x_ST_ResponseLimRS1[x][y]

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

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

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

Description: KaEOSD_x_ST_ResponseLimRS2[x][y]

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

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

Initial Supporting table - P0234_KtBSTD_p_CntrlDevNegLim

Description: Negative boost pressure control deviation fail limit.

Notes:

y/x	105.00	114.00	120.00	130.00	140.00	150.00	160.00	170.00	180.00	220.00
1,000	-11.00	-11.00	-15.00	-15.00	-12.50	-12.50	-15.00	-15.00	-15.00	-15.00
1,500	-11.00	-11.00	-15.00	-15.00	-12.50	-12.50	-15.00	-15.00	-15.00	-15.00
1,900	-11.00	-11.00	-15.00	-15.00	-12.50	-12.50	-15.00	-15.00	-15.00	-15.00
2,500	-12.00	-12.00	-15.00	-15.00	-13.21	-13.21	-15.00	-15.00	-15.00	-15.00
3,000	-12.00	-12.00	-15.00	-15.00	-13.49	-16.35	-19.21	-19.21	-19.21	-19.21
3,500	-12.00	-12.00	-16.75	-16.15	-15.56	-19.49	-23.42	-23.42	-23.42	-23.42
4,000	-13.00	-13.00	-16.75	-16.75	-16.75	-21.75	-26.75	-26.75	-26.75	-26.75
4,500	-13.00	-13.00	-16.75	-16.75	-16.75	-21.75	-26.75	-26.75	-26.75	-26.75
5,500	-13.00	-13.00	-16.75	-16.75	-16.75	-21.75	-26.75	-26.75	-26.75	-26.75
6,500	-13.00	-13.00	-16.75	-16.75	-16.75	-21.75	-26.75	-26.75	-26.75	-26.75

Initial Supporting table - P0234_P0299_KtBSTD_p_CntrlDevAmbAirCorr

Description: Additative offset on boost pressure control deviation fail limit.

Notes:

y/x	60.00	70.00	80.00	90.00	95.00	110.00
1,500	50.00	42.00	18.00	8.00	3.00	0.00
2,500	45.00	37.00	13.00	6.33	3.00	0.00
3,000	35.86	27.57	15.43	7.14	3.00	0.00
4,000	40.57	31.71	20.29	8.76	3.00	0.00
5,000	44.29	34.86	25.14	10.38	3.00	0.00
6,000	50.00	40.00	30.00	12.00	3.00	0.00

Initial Supporting table - P0234_P0299_KtBSTD_t_CntrlDevEnblDelay

Description: Timer to stabilize enable conditions for over and underboost diagnosis.

Notes:

y/x	1,000	1,500	1,900	2,500	3,000	3,500	4,000	4,500	5,500	6,500
1	3.0000	2.2500	1.8750	1.5000	1.3750	1.2500	1.1250	1.0000	0.7500	0.6250

Initial Supporting table -P0299_KtBSTD_p_CntrlDevPosLim

Description: Positive boost pressure control deviation fail limit.

Notes:

y/x	105.00	114.00	120.00	130.00	140.00	150.00	160.00	170.00	180.00	220.00
1,000	4.00	9.00	16.60	20.00	31.00	36.00	41.00	46.00	53.50	85.00
1,500	4.00	9.00	16.60	20.00	31.00	36.00	41.00	46.00	53.50	85.00
1,900	4.00	9.00	16.10	21.00	29.00	34.00	39.00	44.00	51.50	85.00
2,500	4.00	8.00	13.10	18.00	26.00	31.00	36.00	41.00	65.00	85.00
3,000	4.00	6.00	14.87	18.00	24.75	28.50	33.50	38.50	65.00	70.00
3,500	4.00	6.00	10.15	12.00	16.00	20.00	23.75	25.00	65.00	70.00
4,000	4.00	6.00	8.11	10.00	15.00	20.00	20.00	25.00	65.00	70.00
4,500	4.00	6.00	8.11	10.00	15.00	20.00	20.00	25.00	65.00	70.00
5,500	4.00	6.00	8.11	10.00	15.00	20.00	20.00	25.00	65.00	70.00
6,500	4.00	6.00	8.11	10.00	15.00	20.00	20.00	25.00	65.00	70.00

Initial Supporting table - P226B_KtBSTD_r_ExcsvBstPresLim

Description: Compressor pressure ratio fail limit for excessive boost pressure diagnosis.

Notes:

y/x	0.000	50.000	75.000	100.000	125.000	150.000	175.000	200.000
1	3.299	3.293	3.294	3.295	3.310	3.310	3.310	3.310

Initial Supporting table - 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

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

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	

Initial Supporting table -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

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

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

Initial Supporting table - 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.

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	425	425	425	425	425	425	425

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	425	425	425	425	425	425	

Initial Supporting table -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.

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	2,800	2,800	2,800	2,800	2,800	2,800	2,800

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	2,800	2,800	2,800	2,800	2,800	2,800	

Initial Supporting table -VCE_MinVacReducedTorqMode

Description: Minimum Vacuum allowed in VCE mode

Notes: For P3400: KtVCEC_p_MinVacReducedTrqMode

VCE_MinVacReducedTorqMode - Part 1									
y/x	500	600	700	800	900	1,000	1,100	1,200	1,300
1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
VCE_MinVacReducedTorqMode - Part 2									
y/x	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200
1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
VCE_MinVacReducedTorqMode - Part 3									
y/x	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	
1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	

Initial Supporting table - 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

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	10	10	10	10	10	10	10

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	10	10	10	10	10	10	

Initial Supporting table - 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

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

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

Initial Supporting table - 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	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

Initial Supporting table - VCE_StartUpDelayTime

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	20	40	60	80	100	120	140	160	180	240	300	360	420	480	540	600
1	2	4	6	8	10	12	14	16	18	20	20	20	20	20	20	20	20

Initial Supporting table - 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	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Initial Supporting table - 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	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Initial Supporting table - 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	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318

Initial Supporting table - P0068_Delta MAF Threshold f(TPS)

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

Notes: P0068, KtTPSD_dm_MAF_DesThrDelt

y/x	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	100.00
1.00	7.80	9.85	21.70	8.14	14.25	22.30	33.45	255.00	255.00

Initial Supporting table - P0068_Delta MAP Threshold f(TPS)

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

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	42.95	33.79	80.42	11.90	16.47	23.07	23.59	255.00	255.00

Initial Supporting table - P0068_Maximum MAF f(RPM)

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

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	20.00	50.00	80.00	115.00	150.00	176.00	194.00	203.00	210.00

Initial Supporting table - P0068_Maximum MAF f(Volts)

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

Notes: P0068, KtTPSD_dm_MaxMAF_VsVoltage

y/x	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00
1.00	0.00	20.00	60.00	150.00	250.00	300.00	300.00	300.00	300.00

Initial Supporting table - P00C7: Twin Turbo Failure Matrix

Description: Intake Air Pressure System Performance Failure Matrix for Twin Turbo Applications

Notes: This table describes the combination of intake system pressure sensor difference combinations that will set P00C7 on twin turbocharged applications

y/x	1	2	3	4	5	6	7
1	DTC	MAP & TCBP Diff	MAP & Baro Diff	MAP & Baro2 Diff	TCBP & Baro Diff	TCBP & Baro2 Diff	Baro & Baro2 Diff
2	No DTC	N	N	N	N	N	N
3	P00C7	Y	N	N	N	N	N
4	P00C7	N	Y	N	N	N	N
5	P00C7	Y	Y	N	N	N	N
6	P00C7	N	N	Y	N	N	N
7	P00C7	Y	N	Y	N	N	N
8	P00C7	N	Y	Y	N	N	N
9	P0106	Y	Y	Y	N	N	N
10	P00C7	N	N	N	Y	N	N
11	P00C7	Y	N	N	Y	N	N
12	P00C7	N	Y	N	Y	N	N
13	P00C7	Y	Y	N	Y	N	N
14	P00C7	N	N	Y	Y	N	N
15	P00C7	Y	N	Y	Y	N	N
16	P00C7	N	Y	Y	Y	N	N
17	P00C7	Y	Y	Y	Y	N	N
18	P00C7	N	N	N	N	Y	N
19	P00C7	Y	N	N	N	Y	N
20	P00C7	N	Y	N	N	Y	N
21	P00C7	Y	Y	N	N	Y	N
22	P00C7	N	N	Y	N	Y	N
23	P00C7	Y	N	Y	N	Y	N
24	P00C7	N	Y	Y	N	Y	N
25	P00C7	Y	Y	Y	N	Y	N
26	P00C7	N	N	N	Y	Y	N
27	P0236	Y	N	N	Y	Y	N
28	P00C7	N	Y	N	Y	Y	N
29	P00C7	Y	Y	N	Y	Y	N
30	P00C7	N	N	Y	Y	Y	N
31	P00C7	Y	N	Y	Y	Y	N
32	P00C7	N	Y	Y	Y	Y	N
33	P00C7	Y	Y	Y	Y	Y	N
34	P00C7	N	N	N	N	N	Y

Initial Supporting table - P00C7: Twin Turbo Failure Matrix

35	P00C7	Y	N	N	N	N	Y
36	P00C7	N	Y	N	N	N	Y
37	P00C7	Y	Y	N	N	N	Y
38	P00C7	N	N	Y	N	N	Y
39	P00C7	Y	N	Y	N	N	Y
40	P00C7	N	Y	Y	N	N	Y
41	P00C7	Y	Y	Y	N	N	Y
42	P00C7	N	N	N	Y	N	Y
43	P00C7	Y	N	N	Y	N	Y
44	P2227	N	Y	N	Y	N	Y
45	P00C7	Y	Y	N	Y	N	Y
46	P00C7	N	N	Y	Y	N	Y
47	P00C7	Y	N	Y	Y	N	Y
48	P00C7	N	Y	Y	Y	N	Y
49	P00C7	Y	Y	Y	Y	N	Y
50	P00C7	N	N	N	N	Y	Y
51	P00C7	Y	N	N	N	Y	Y
52	P00C7	N	Y	N	N	Y	Y
53	P00C7	Y	Y	N	N	Y	Y
54	P222B	N	N	Y	N	Y	Y
55	P00C7	Y	N	Y	N	Y	Y
56	P00C7	N	Y	Y	N	Y	Y
57	P00C7	Y	Y	Y	N	Y	Y
58	P00C7	N	N	N	Y	Y	Y
59	P00C7	Y	N	N	Y	Y	Y
60	P00C7	N	Y	N	Y	Y	Y
61	P00C7	Y	Y	N	Y	Y	Y
62	P00C7	N	N	Y	Y	Y	Y
63	P00C7	Y	N	Y	Y	Y	Y
64	P00C7	N	Y	Y	Y	Y	Y
65	P00C7	Y	Y	Y	Y	Y	Y

Initial 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

Initial 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	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on MAF Est

Description: P0101_P0106_P010B_P0121_P0236_P1101 MAF2 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

Initial Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on RPM

Description: P0101_P0106_P010B_P0121_P0236_P1101 MAF2 Residual Weight Factor based on RPM

Notes:

y/x	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Description: KtECTD_T_HSC_FastFailTempDiff

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

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

Initial Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest1

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

y/x	-16	-4	8	20	32	44	68
1	10,424	9,013	7,603	6,193	4,783	3,373	1,962

Initial Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest0

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

y/x	-16	-4	8	20	32	44	68
1	12,629	11,234	9,840	8,445	7,049	5,654	2,864

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

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

Notes: P0606, KaPISD_t_LastSeedTimeout[x]

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

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

Description: Fail threshold for PSW per operating loop.

Notes: P0606, KaPISD_Cnt_SequenceFail[x]

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

Initial 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

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

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

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

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

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

Notes: P16F3, KtMAPI_p_ES_TB_MAP_DeltaThresh

y/x	0.00	50.00	100.00	150.00	200.00	300.00
1.00	11.90	11.90	11.90	11.90	11.90	11.90

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

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

Notes: P16F3, KtSPRK_phi_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	15.03	15.00	15.00	15.00	16.66	19.02	18.64	18.25	15.17	15.00	15.00	15.00	15.00	15.00	15.00	15.00
160.00	125.00	15.00	15.00	15.00	15.00	15.00	16.20	16.05	15.89	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
240.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
320.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
400.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
480.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
560.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
640.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
720.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
800.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
880.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
960.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,040.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,120.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,200.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,280.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,360.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00

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

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

Notes: P16F3, KtSPDC_M_ExternalLoad

y/x	-40.00	-20.00	-10.00	0.00	50.00	90.00
350.00	400.00	400.00	400.00	400.00	400.00	400.00
450.00	400.00	400.00	400.00	400.00	400.00	400.00
550.00	400.00	400.00	400.00	400.00	400.00	400.00
600.00	400.00	400.00	400.00	400.00	400.00	400.00
700.00	368.15	368.15	368.15	368.15	314.88	304.65
800.00	336.29	336.29	336.29	336.29	229.76	209.31
900.00	336.29	336.29	336.29	336.29	218.79	199.15
1,000.00	336.29	336.29	336.29	336.29	207.81	188.99
1,100.00	336.29	336.29	336.29	289.05	170.30	152.99
1,200.00	336.29	336.29	336.29	241.81	132.79	116.99
1,300.00	336.29	336.29	321.48	194.27	97.80	82.77
1,400.00	336.29	336.29	306.67	146.73	62.80	48.55
2,000.00	168.74	140.81	121.49	58.77	18.73	12.75
2,500.00	64.60	51.85	44.87	30.23	11.89	7.22
3,000.00	48.36	38.11	33.50	28.90	13.74	8.50
4,000.00	58.66	46.64	41.30	36.40	18.59	12.36
6,000.00	88.34	74.49	68.33	62.69	42.16	34.98

Initial Supporting table -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	500	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	500	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table -1stFireAfterMisJerkAFM

Description: Multiplier for establishing the expected jerk of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

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

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

Initial Supporting table - 1stFireAftrMisAcelAFM

Description: Multiplier for establishing the expected acceleration of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

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

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

Initial Supporting table - Abnormal Cyl 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

Initial Supporting table - 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

Initial Supporting table - 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	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Initial Supporting table - 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	500	600	700	800	900	1,000	1,200	1,400	1,600
12	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
16	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
18	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
20	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
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

Initial Supporting table - 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	500	600	700	800	900	1,000	1,200	1,400	1,600
12	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
16	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
18	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
20	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
24	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
30	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
40	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
60	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
98	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33

Initial Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	4.8	4.8	4.8	4.8	4.8	4.8
10	11.3	11.3	4.8	4.8	4.8	4.8	4.8	4.8
20	11.3	11.3	4.8	4.8	4.8	4.8	4.8	4.8
30	9.0	9.0	4.8	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

Initial Supporting table - 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
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	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
50	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
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	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
50	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
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - CombustModeIdleTbl

Description: Combustion modes that will force use of Idle table. A value of CeCMBR_i_CombModesMax means not selected.

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

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

Initial Supporting table - ConsecCylModDecel

Description: 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
98	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - 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	500	600	700	800	900	1,000	1,200	1,400	1,600
8	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
12	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
16	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
20	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
24	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
30	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
40	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
60	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
98	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83

Initial Supporting table - 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	500	600	700	800	900	1,000	1,200	1,400	1,600
8	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
12	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
16	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
20	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
24	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
30	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
40	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
60	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
98	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17

Initial Supporting table - 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
5	-1	-1	-1	-1	-1	-1	-1	-1	-1
10	-1	-1	-1	-1	-1	-1	-1	-1	-1
20	-1	-1	-1	-1	-1	-1	-1	-1	-1
30	-1	-1	-1	-1	-1	-1	-1	-1	-1
40	-1	-1	-1	-1	-1	-1	-1	-1	-1
50	-1	-1	-1	-1	-1	-1	-1	-1	-1
60	-1	-1	-1	-1	-1	-1	-1	-1	-1
80	-1	-1	-1	-1	-1	-1	-1	-1	-1
100	-1	-1	-1	-1	-1	-1	-1	-1	-1

Initial Supporting table - 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
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	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
50	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
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - CylModeDecel

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

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

CylModeDecel - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	3,600	3,400	2,200	1,500	850	582	532	423	340	151	115	100	80
6	3,400	3,200	2,197	1,412	784	552	518	298	226	128	87	68	45
8	3,200	3,000	2,791	1,429	1,005	606	565	324	290	187	112	76	53
10	3,522	3,200	3,050	1,668	1,233	839	647	432	328	265	165	79	62
12	4,226	3,500	3,309	2,107	1,466	1,015	791	539	385	320	210	131	83
14	4,931	3,800	3,568	2,546	1,751	1,191	935	647	465	364	257	159	111
16	5,635	4,000	3,828	2,986	2,035	1,387	1,079	755	545	448	327	205	129
18	6,339	4,500	4,087	3,425	2,320	1,506	1,224	862	555	612	374	253	154
20	7,044	4,800	4,346	3,864	2,604	1,720	1,368	970	706	760	433	305	193
22	7,748	5,000	4,605	4,303	2,889	1,896	1,512	1,078	1,403	800	538	324	229
24	8,452	5,500	4,865	4,743	3,173	2,073	1,656	1,185	867	825	568	371	256
26	9,157	6,500	5,124	5,182	3,458	2,249	1,801	1,293	947	937	644	382	264
30	10,565	7,500	5,642	6,060	4,027	2,601	2,089	1,508	1,108	696	760	453	340
40	14,087	8,396	6,939	6,700	5,449	3,483	2,810	2,047	1,510	929	645	540	393
60	16,000	10,496	8,235	8,000	6,872	4,364	3,531	2,585	1,912	1,162	808	689	501
78	18,000	15,000	10,000	9,500	8,294	5,245	4,253	3,123	2,314	1,396	971	839	610
97	20,000	18,000	15,000	14,000	13,629	8,550	6,957	5,142	3,821	2,271	1,583	1,399	1,017

CylModeDecel - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
3	70	44	30	27	23	20	16	13	9	7	5	5	5
6	39	32	25	23	19	14	10	7	6	6	3	3	2
8	41	38	26	24	21	14	10	9	6	6	3	3	3
10	42	38	34	30	25	17	10	9	6	6	4	4	4
12	56	49	41	34	30	20	12	9	8	7	5	5	4
14	72	59	48	39	32	23	15	12	9	8	6	6	5
16	84	70	52	41	37	25	17	13	10	8	7	7	6
18	104	84	57	45	39	27	19	15	11	10	7	7	6
20	117	96	61	51	42	30	20	16	12	11	8	8	7
22	148	112	76	65	55	32	22	19	14	13	9	9	7
24	178	132	90	74	58	36	25	20	15	14	10	10	8
26	197	147	121	91	75	41	30	23	16	15	11	11	9
30	262	199	131	105	89	61	36	27	18	17	12	12	10

Initial Supporting table - CylModeDecel

40	316	227	181	150	127	84	49	40	25	22	16	16	13
60	404	291	249	194	164	108	63	50	31	28	20	20	17
78	493	355	304	238	201	131	76	61	37	33	24	24	20
97	825	595	512	402	342	218	127	100	59	54	39	39	32

Initial Supporting table - CylModeJerk

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

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

CylModeJerk - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	4,200	3,700	1,297	1,072	694	355	344	265	204	92	59	63	45
6	4,100	3,600	1,259	1,042	683	347	309	136	117	66	45	31	25
8	4,000	3,500	2,469	1,112	729	401	331	139	134	104	60	38	26
10	4,500	4,000	2,964	1,404	1,010	485	390	163	199	142	87	45	35
12	5,000	4,500	3,459	1,696	1,410	510	461	223	246	203	130	79	46
14	5,500	5,000	3,954	1,988	1,776	574	546	284	330	249	168	109	60
16	6,000	5,500	4,449	2,279	2,141	836	601	344	413	312	212	125	80
18	6,500	6,000	4,944	2,571	2,507	1,568	808	404	480	382	248	162	102
20	7,044	6,500	5,439	2,863	2,873	1,769	912	464	580	486	324	186	139
22	7,748	7,000	5,934	3,155	3,239	1,971	1,017	525	811	537	374	223	178
24	8,452	7,500	6,429	3,446	3,604	2,173	1,121	585	746	571	398	281	192
26	9,157	8,000	6,924	3,738	3,970	2,375	1,226	645	830	589	494	304	180
30	10,565	9,000	7,914	4,322	4,702	2,779	1,435	766	996	499	536	319	255
40	14,087	10,000	8,100	5,780	6,530	3,790	1,957	1,067	1,413	670	535	427	294
60	16,000	14,000	10,000	8,698	8,000	5,811	3,003	1,670	1,500	1,012	812	668	457
78	18,000	16,000	14,000	11,251	10,000	7,579	3,917	2,198	1,800	1,311	1,054	878	599
97	20,000	18,000	16,000	14,168	13,000	9,600	4,963	2,801	2,000	1,652	1,331	1,119	762

CylModeJerk - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
3	37	27	23	20	17	15	12	9	7	7	4	4	3
6	18	17	15	13	11	9	5	8	4	4	4	4	2
8	20	17	15	14	12	10	5	5	4	4	2	2	2
10	23	18	19	15	13	12	5	6	4	4	3	3	2
12	30	25	22	18	15	15	9	7	5	5	3	3	2
14	33	31	27	20	17	15	10	9	6	6	4	4	3
16	48	34	30	21	19	16	10	10	7	7	4	4	3
18	68	45	33	26	22	19	11	11	8	8	4	4	4
20	74	56	37	33	26	20	13	13	9	9	5	5	4
22	100	78	50	43	36	24	15	14	9	9	5	5	4
24	121	88	62	45	40	26	24	16	10	10	6	6	5
26	135	108	80	61	50	35	26	17	11	10	6	6	5
30	174	107	93	74	61	46	31	20	13	11	7	7	6

Initial Supporting table - CylModeJerk

40	227	172	124	103	89	63	43	28	17	14	10	10	8
60	358	273	193	159	144	97	67	43	26	19	14	14	11
78	473	361	253	209	192	127	89	57	34	23	18	18	15
97	605	462	322	265	247	162	113	72	42	28	23	23	19

Initial Supporting table - DeacCylInversionDecel

Description: Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong" If deactivated cylinders don't decelerate at least this amount then the crank signal is inverting. Function of speed and load.

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

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
10	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
20	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
30	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
40	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
50	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
60	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
80	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
100	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384

Initial Supporting table - DeacCylInversionJerk

Description: Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong" If deactivated cylinders don't jerk at least this amount then the crank signal is inverting. Function of speed and load.

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

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
10	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
20	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
30	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
40	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
50	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
60	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
80	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
100	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384

Initial Supporting table - EngineOverSpeedLimit

Description: Engine OverSpeed Limit versus gear

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

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	6,500	6,500	6,500	6,500	6,500	6,500	4,000

EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	4,000	6,500	6,500	4,000	4,000	4,000	

Initial Supporting table - 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	2,060	2,010	1,910	1,710	1,435	1,175	700	540	300	280	270	230	180
6	2,070	2,020	1,920	1,720	1,445	1,185	710	550	300	290	280	240	190
8	2,080	2,030	1,930	1,730	1,455	1,195	720	560	300	300	290	250	200
10	2,090	2,040	1,940	1,740	1,465	1,205	730	570	310	310	300	260	210
12	2,100	2,050	1,950	1,750	1,475	1,215	740	580	320	310	310	270	220
14	2,100	2,050	1,950	1,750	1,485	1,225	750	590	330	310	310	280	230
16	2,100	2,050	1,950	1,750	1,495	1,235	760	600	340	330	330	290	240
18	2,100	2,050	1,950	1,750	1,505	1,235	770	525	350	340	340	300	250
20	2,100	2,050	1,950	1,750	1,700	1,245	780	610	360	340	350	320	260
22	2,070	2,060	2,010	1,760	1,710	1,295	790	620	370	350	360	330	270
24	2,080	2,070	2,020	1,760	1,720	1,265	800	630	370	360	370	330	280
26	2,090	2,080	2,030	2,030	1,730	1,275	800	640	380	370	380	340	290
28	2,100	2,090	2,040	2,040	1,740	1,285	860	650	390	380	390	350	300
30	2,110	2,100	2,050	2,050	1,750	1,295	870	660	400	390	400	350	310
32	2,120	2,110	2,060	2,060	1,760	1,305	880	670	410	400	410	360	320
34	2,130	2,120	2,070	2,070	1,770	1,315	890	680	420	410	395	370	330
36	2,140	2,130	2,080	2,080	1,780	1,325	900	690	430	420	405	380	340

Initial Supporting table - 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	2,310	2,260	2,060	1,815	1,415	1,120	700	500	340	330	320	305	260
6	2,320	2,270	2,070	1,825	1,425	1,130	710	510	350	340	330	315	270
8	2,330	2,280	2,080	1,835	1,435	1,140	720	520	360	350	340	325	280
10	2,340	2,290	2,090	1,845	1,445	1,150	730	530	370	360	350	335	285
12	2,350	2,300	2,100	1,855	1,455	1,160	740	540	380	370	355	340	290
14	2,350	2,300	2,100	1,865	1,465	1,170	740	550	390	380	360	345	295
16	2,350	2,300	2,100	1,865	1,465	1,170	740	560	400	385	365	350	300
18	2,350	2,300	2,100	1,865	1,465	1,170	750	570	410	390	370	355	305
20	2,350	2,300	2,100	1,885	1,585	1,180	760	580	420	395	375	360	310
22	2,360	2,310	2,260	2,210	1,595	1,190	770	590	430	400	380	365	315
24	2,370	2,320	2,270	2,230	1,605	1,200	780	600	435	405	385	370	320
26	2,380	2,330	2,280	2,240	1,615	1,210	790	610	440	410	390	375	325
28	2,390	2,340	2,290	2,250	1,625	1,230	800	620	445	415	395	380	330
30	2,400	2,350	2,300	2,260	1,635	1,240	810	630	450	420	400	385	335
32	2,410	2,360	2,320	2,270	1,645	1,250	820	640	455	430	410	390	340
34	2,420	2,370	2,330	2,280	1,655	1,260	830	650	465	440	420	395	345
36	2,430	2,380	2,340	2,290	1,665	1,270	840	660	475	450	425	400	350

Initial Supporting table - 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	2,080	2,030	800	500	300	200	180	160	140	120	100	50	40
6	2,070	2,020	700	440	270	190	140	100	80	50	30	25	18
8	2,080	2,030	800	450	290	220	160	120	90	60	35	25	19
10	2,090	2,040	1,000	650	400	260	200	140	110	70	40	30	23
12	2,100	2,050	1,200	750	420	320	220	170	120	80	50	40	40
14	2,100	2,050	1,400	850	550	360	260	190	150	90	80	60	50
16	2,100	2,050	1,600	1,000	600	420	320	240	190	110	100	70	60
18	2,100	2,050	1,800	1,200	700	480	340	270	240	120	110	80	70
20	2,100	2,050	2,000	1,300	800	640	440	350	250	130	120	90	80
22	2,070	2,060	2,010	1,310	810	700	450	360	260	140	130	100	90
24	2,080	2,070	2,020	1,320	820	710	460	370	270	150	140	110	100
26	2,090	2,080	2,030	1,330	830	720	470	380	280	160	150	120	110
28	2,100	2,090	2,040	1,340	840	730	480	390	290	170	160	130	120
30	2,110	2,100	2,050	1,350	850	740	490	400	300	180	170	140	130
32	2,120	2,110	2,060	1,360	860	750	500	410	310	190	180	150	140
34	2,130	2,120	2,070	1,370	870	760	510	420	320	200	190	160	150
36	2,140	2,130	2,080	1,380	880	770	520	430	330	210	200	170	160

Initial Supporting table - 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	2,380	2,330	800	500	300	200	180	160	140	120	100	50	40
6	2,320	2,270	700	440	270	190	150	120	60	20	30	25	15
8	2,330	2,280	800	450	290	220	160	140	80	40	30	25	15
10	2,340	2,290	1,000	650	400	260	220	150	100	60	30	30	20
12	2,350	2,300	1,200	750	440	300	240	160	120	70	30	40	30
14	2,350	2,300	1,400	850	600	340	250	200	160	110	70	50	40
16	2,350	2,300	1,600	1,000	640	440	330	260	230	180	140	60	50
18	2,350	2,300	1,800	1,200	800	450	340	280	240	190	150	70	60
20	2,350	2,300	1,810	1,300	1,000	600	500	400	250	200	160	80	70
22	2,360	2,310	1,820	1,310	1,010	700	550	420	260	210	170	90	80
24	2,370	2,320	1,830	1,320	1,020	710	560	430	270	220	180	100	90
26	2,380	2,330	1,840	1,330	1,030	720	570	440	280	230	190	110	100
28	2,390	2,340	1,850	1,340	1,040	730	580	450	290	240	200	120	110
30	2,400	2,350	1,860	1,350	1,050	740	590	460	300	250	210	130	120
32	2,410	2,360	1,870	1,360	1,060	750	600	470	310	260	220	140	130
34	2,420	2,370	1,880	1,370	1,070	760	610	480	320	270	230	150	140
36	2,430	2,380	1,890	1,380	1,080	770	620	490	330	280	240	160	150

Initial Supporting table - InfrequentRegen

Description: Initiates a misfire delay when the current combustion mode matchs a selection in the table. Diesel only. A value of CeCMBR_i_CombModesMax means not selected.

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

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

Initial Supporting table - Number of Normals

Description: 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	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Initial 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

Initial 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	-32	-20	-20	-16	-8	0	8	16	20	24	32	40	48	64	80	112
0	0.0	0.0	0.0	9.5	8.0	5.5	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	3.0
13	0.0	0.0	0.0	9.5	8.0	5.5	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	3.0
25	0.0	0.0	0.0	9.5	8.0	5.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38	0.0	0.0	0.0	12.0	9.0	6.1	4.4	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
50	0.0	0.0	0.0	15.0	12.0	8.0	5.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
63	0.0	0.0	0.0	15.0	15.0	11.0	7.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
75	0.0	0.0	0.0	15.0	15.0	12.0	9.0	5.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
88	0.0	0.0	0.0	15.0	15.0	15.0	13.0	8.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
100	0.0	0.0	0.0	15.0	15.0	15.0	13.0	10.0	6.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Initial 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	-32	-20	-20	-16	-8	0	8	16	20	24	32	40	48	64	80	112
1	11.0	11.0	10.0	10.0	9.6	8.6	7.0	5.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0

Initial 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	-32	-20	-20	-16	-8	0	8	16	20	24	32	40	48	64	80	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

Initial 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	-32	-20	-20	-16	-8	0	8	16	20	24	32	40	48	64	80	112
0	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
13	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
38	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
50	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
63	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
75	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
88	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
100	2.0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

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

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

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

P0171_P0172_P0174_P0175 Long-Term Fuel Trim Cell Usage - Part 1				
y/x	CeFADR_e_Cell00_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_NonSelectedCell
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_NonSelectedCell

Initial 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	4.00	8.00	12.00	16.00	20.00	24.00	28.00	32.00
1.00	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20

Initial Supporting table - P0191 - 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	4.00	8.00	12.00	16.00	20.00	24.00	28.00	32.00
1.00	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

Initial Supporting table - 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	

Initial Supporting table - P050D_P1400_CatalystLightOffExtendedEngineRunTimeExit

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

Notes: KtCSEC_t_ExtendedEngineExit. Used for both P050D and P1400.

y/x	0	25	50	75	100
0.000	18	18	18	18	18
0.125	18	18	18	18	18
0.250	18	18	18	18	18
0.375	18	18	18	18	18
0.500	18	18	18	18	18
0.625	18	18	18	18	18
0.750	18	18	18	18	18
0.875	18	18	18	18	18
1.000	18	18	18	18	18

Initial 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	32.5	65.0	82.5	100.0	100.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Initial 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". A lower threshold value that is greater than or equal to the upper threshold for the same gear is an indication that this portion of the diagnostic's enable critera is ignored in that gear. Conversely if the lower threshold value is at or near 0% and the upper threshold for the same gear is at or near 100%, then diagnosis is not enabled in that gear.

Notes: DTCs: P0806; Calibration Name: KaMTCI_Pct_ResidErrCalcEnbHigh; Axis identifies Gear, where "0" - "5" is gear 1 - 6, respectively; "6" is reverse or 7th gear, if equipped, 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

Initial 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". An upper threshold value that is less than or equal to the lower threshold for the same gear is an indication that this portion of the diagnostic's enable critera is ignored in that gear. Conversely if the lower threshold value is at or near 0% and the upper threshold for the same gear is at or near 100%, then diagnosis is not enabled in that gear.

Notes: DTCs: P0806; Calibration Name: KaMTCI_Pct_ResidErrCalcEnbLow; Axis identifies Gear, where "0" - "5" is gear 1 - 6, respectively; "6" is reverse or 7th gear, if equipped, 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

Initial Supporting table - P1400_ColdStartDiagnosticDelayBasedOnEngineRunTime

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

Notes: KtCSED_K_TimeWght - This is used for P1400.

y/x	0	1	3	3	4	5	10	15	20
1	0	0	0	1	1	1	1	1	1

Initial Supporting table - P1400_ColdStartDiagnosticDelayBasedOnEngineRunTimeCalAxis

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

Notes: KnCSED_t_TimeWght - This is used for P1400.

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

Initial Supporting table - P1400_EngineSpeedResidual_Table

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

Notes: KtCSED_dm_Exh - This is used for P1400

y/x	0	400	600	800	850	924	925	950	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800	2,000
1	4	8	8	8	8	8	16	16	16	16	16	16	16	16	16	16	16

Initial Supporting table - P1400_SparkResidual_Table

Description: Predicted engine-out energy potential based on either the desired cold start spark advance value or the actual spark advance value. 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	-16	-12	-8	-4	0	2	5	8	12
1	1.00	1.00	1.00	1.00	1.00	0.94	0.75	0.44	0.38

Initial Supporting table - P171D hydraulic pressure delay

Description: Time to delay the initial x of y counter due to hydraulic transients. Thresholds are a function of transmission fluid temperature. Horizontal axis is transmission fluid temperature (DegC) and table output is delay time (seconds).

Notes: KtCSSD_t_PERF_HydPresDelayTmr

y/x	-40.00	0.00	20.00	30.00	40.00	50.00	60.00
1.0	0.0900	0.0900	0.0800	0.0750	0.0750	0.0750	0.0750

Initial Supporting table - P171D predicted turbine speed error

Description: Predicted turbine speed vs actual turbine speed error. Thresholds are a function of engine speed and transmission fliud temperature. Diagnostic is considered failing above these values. Table vertical axis is engine speed (RPM), horizontal axis is transmission fluid temperature (DegC) and table output is predicted turbine speed error (RPM).

Notes: KtCSSD_n_PERF_TurbSpdFailThsh

y/x	-40.00	0.00	10.00	20.00	40.00
0.00	350.00	350.00	350.00	350.00	350.00
500.00	350.00	350.00	350.00	350.00	350.00
1,100.00	350.00	350.00	350.00	350.00	350.00
1,500.00	350.00	350.00	350.00	350.00	350.00
2,500.00	350.00	350.00	350.00	350.00	350.00

Initial Supporting table - P171D transmission forward gear ratios

Description: Transmission forward gear ratio's (1-6). These values represent the nominal forward gear ratios. These values are used along with the following calibrations to define the valid ratio bands. Units are ratio.

KeCSSD_pct_RVT_1stHighMult
KeCSSD_pct_RVT_1stLowMult
KeCSSD_pct_RVT_HighMult
KeCSSD_pct_RVT_LowMult

Notes: KaCSSD_r_TransRatios

y/x	0.00	1.00	2.00	3.00	4.00	5.00
1.0	4.5600	2.9700	2.0700	1.6800	1.2700	1.0000

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	0.00	10.00	20.00	40.00	50.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	1.00	2.00	3.00	4.00	5.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial 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	1.00	2.00	3.00	4.00	5.00
1.00	0.00	10.00	20.00	40.00	50.00

Initial Supporting table - P219A Normalizer Bank1 Table

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

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

y/x	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200
140	0.00	1.00	4.75	3.00	2.00	3.50	3.00	4.75	5.25	5.00	8.50	4.25	3.50	0.00	0.00	0.00	0.00
160	0.00	10.25	8.25	6.50	3.50	2.75	4.50	5.50	5.50	7.75	13.00	6.50	6.75	0.00	0.00	0.00	0.00
180	0.00	33.00	17.00	14.50	7.25	10.25	9.25	7.75	6.50	10.25	12.75	9.00	8.50	0.00	0.00	0.00	0.00
200	0.00	55.25	25.50	15.50	11.00	12.50	9.50	10.00	10.00	11.25	13.75	8.00	7.50	0.00	0.00	0.00	0.00
220	0.00	81.25	28.25	13.00	12.00	14.00	11.00	10.25	10.50	11.50	16.00	7.50	6.00	0.00	0.00	0.00	0.00
240	0.00	0.00	24.50	11.00	19.25	16.00	14.00	13.00	11.50	12.75	19.50	8.50	7.25	0.00	0.00	0.00	0.00
260	0.00	0.00	36.00	17.50	26.00	17.50	18.25	17.50	14.00	16.25	22.50	10.25	8.00	0.00	0.00	0.00	0.00
280	0.00	0.00	54.50	21.75	26.75	24.50	26.25	22.50	17.25	17.50	29.00	12.75	10.25	0.00	0.00	0.00	0.00
300	0.00	0.00	86.50	24.50	38.00	32.50	35.50	30.75	23.00	23.00	36.25	15.50	12.50	0.00	0.00	0.00	0.00
320	0.00	0.00	96.00	33.75	47.00	44.00	46.75	38.00	27.75	30.50	52.00	17.00	15.00	0.00	0.00	0.00	0.00
340	0.00	0.00	126.00	52.50	56.25	81.50	60.50	44.25	30.00	30.75	55.00	19.00	16.25	0.00	0.00	0.00	0.00
360	0.00	0.00	152.25	58.75	91.25	125.75	71.00	59.00	36.25	36.00	55.50	22.75	20.00	0.00	0.00	0.00	0.00
380	0.00	0.00	195.25	71.50	170.50	174.50	93.25	68.00	45.00	40.25	61.50	31.75	24.50	0.00	0.00	0.00	0.00
400	0.00	0.00	216.50	93.25	151.25	171.00	103.00	84.25	65.00	58.00	52.50	65.25	30.50	0.00	0.00	0.00	0.00
420	0.00	0.00	221.75	98.50	141.75	175.00	109.75	97.00	80.00	87.75	63.50	65.50	30.00	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	99.00	180.50	190.00	109.50	117.50	123.25	103.50	59.00	78.25	38.00	0.00	0.00	0.00	0.00
460	0.00	0.00	0.00	108.25	204.00	197.00	141.00	136.00	140.50	169.25	76.75	95.50	94.75	0.00	0.00	0.00	0.00

Initial Supporting table - P219A Quality Factor Bank1 Table

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

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

y/x	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200
140	0.00	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
160	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
180	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
200	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
220	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
240	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
260	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
280	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
300	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
320	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
340	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
360	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
380	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
400	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
420	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
440	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
460	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

Initial Supporting table - P219A Variance Threshold Bank1 Table

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

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

y/x	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200
140	0.00	3.75	2.75	2.75	3.50	2.75	3.75	3.00	2.25	2.50	2.50	2.00	2.50	0.00	0.00	0.00	0.00
160	0.00	6.50	4.50	4.50	5.00	5.50	4.25	4.00	4.00	2.50	2.25	2.50	3.00	0.00	0.00	0.00	0.00
180	0.00	6.00	6.50	4.50	5.25	6.50	4.75	4.00	4.25	3.50	3.50	3.00	3.25	0.00	0.00	0.00	0.00
200	0.00	5.50	7.00	6.50	6.50	6.75	5.75	5.75	5.00	4.00	2.75	3.00	2.75	0.00	0.00	0.00	0.00
220	0.00	5.75	7.50	6.75	7.75	7.50	7.00	6.75	6.00	4.00	3.25	3.50	4.00	0.00	0.00	0.00	0.00
240	0.00	0.00	7.75	7.50	7.00	8.00	7.50	7.50	6.50	3.75	3.75	3.50	4.00	0.00	0.00	0.00	0.00
260	0.00	0.00	9.50	6.50	7.75	9.00	8.75	8.00	7.50	4.75	3.50	4.00	5.50	0.00	0.00	0.00	0.00
280	0.00	0.00	8.50	7.75	9.00	9.00	10.00	8.50	8.25	5.50	4.25	4.25	5.00	0.00	0.00	0.00	0.00
300	0.00	0.00	10.75	8.50	10.50	9.75	9.25	9.50	9.00	5.50	5.00	4.50	5.00	0.00	0.00	0.00	0.00
320	0.00	0.00	10.50	10.00	12.25	10.75	11.00	10.50	9.75	5.75	6.00	4.50	5.00	0.00	0.00	0.00	0.00
340	0.00	0.00	12.50	11.50	14.50	14.50	12.25	11.50	10.50	6.50	6.50	5.25	5.75	0.00	0.00	0.00	0.00
360	0.00	0.00	13.75	13.00	15.00	14.50	11.75	12.25	11.25	7.00	6.75	5.25	6.50	0.00	0.00	0.00	0.00
380	0.00	0.00	14.50	13.00	19.50	16.75	12.25	13.25	11.75	8.50	7.50	7.25	8.50	0.00	0.00	0.00	0.00
400	0.00	0.00	14.25	12.75	18.75	20.25	14.75	13.50	11.25	8.75	9.50	9.50	9.25	0.00	0.00	0.00	0.00
420	0.00	0.00	13.50	13.50	15.50	23.00	13.50	14.50	13.00	9.75	11.50	11.00	15.50	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	11.50	12.50	11.75	12.50	12.50	10.25	12.00	14.00	11.25	13.50	0.00	0.00	0.00	0.00
460	0.00	0.00	0.00	11.75	8.25	14.25	12.00	12.50	9.50	13.25	14.75	13.25	14.75	0.00	0.00	0.00	0.00

Initial Supporting table - P219B Normalizer Bank2 Table

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

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

y/x	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200
140	0.00	3.00	4.25	1.25	1.50	1.00	1.25	1.25	1.00	1.50	2.75	1.00	2.50	0.00	0.00	0.00	0.00
160	0.00	5.50	5.25	4.25	1.75	2.75	3.00	3.25	4.50	4.50	7.50	2.50	4.75	0.00	0.00	0.00	0.00
180	0.00	11.50	11.75	6.00	8.25	7.50	7.00	6.25	7.00	5.00	5.50	5.00	4.50	0.00	0.00	0.00	0.00
200	0.00	5.25	10.25	9.00	2.75	8.50	8.25	6.00	6.25	5.00	5.00	4.50	4.00	0.00	0.00	0.00	0.00
220	0.00	1.00	9.25	9.00	9.25	7.25	7.00	6.75	5.00	4.75	5.50	4.75	4.50	0.00	0.00	0.00	0.00
240	0.00	0.00	11.25	12.50	12.25	8.00	7.75	7.00	6.25	6.50	8.25	8.00	5.50	0.00	0.00	0.00	0.00
260	0.00	0.00	15.00	18.25	1.00	11.50	11.00	10.50	10.50	11.25	9.50	10.00	7.00	0.00	0.00	0.00	0.00
280	0.00	0.00	13.50	18.00	18.00	16.00	17.75	15.25	15.75	14.50	15.75	13.25	10.00	0.00	0.00	0.00	0.00
300	0.00	0.00	17.50	18.50	21.00	23.00	24.25	21.75	22.00	19.25	19.50	17.00	13.50	0.00	0.00	0.00	0.00
320	0.00	0.00	27.75	26.00	28.50	48.50	52.00	30.00	27.50	26.75	30.00	26.00	15.50	0.00	0.00	0.00	0.00
340	0.00	0.00	41.75	49.25	39.25	69.25	62.25	45.25	35.75	32.00	39.00	25.00	22.75	0.00	0.00	0.00	0.00
360	0.00	0.00	61.50	37.00	54.75	93.75	78.25	53.50	42.50	37.75	46.25	35.50	40.50	0.00	0.00	0.00	0.00
380	0.00	0.00	97.75	38.00	106.00	110.50	82.75	54.50	46.25	42.50	59.50	54.50	57.25	0.00	0.00	0.00	0.00
400	0.00	0.00	135.75	62.00	124.25	130.00	94.75	60.75	55.00	58.50	61.00	1.00	67.25	0.00	0.00	0.00	0.00
420	0.00	0.00	151.50	81.75	168.25	139.25	84.00	69.00	71.00	76.25	72.00	80.75	70.50	0.00	0.00	0.00	0.00
440	0.00	0.00	129.25	102.00	97.25	163.00	89.00	74.50	98.00	104.00	79.25	93.75	85.00	0.00	0.00	0.00	0.00
460	0.00	0.00	0.00	124.50	150.25	187.75	123.50	92.00	123.50	148.00	119.25	127.00	132.50	0.00	0.00	0.00	0.00

Initial Supporting table - P219B Quality Factor Bank2 Table

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

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

y/x	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200
140	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.00	0.00	0.00	0.00
160	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
180	0.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
200	0.00	0.80	1.00	1.00	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
220	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
240	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
260	0.00	0.00	1.00	1.00	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
280	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
300	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
320	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
340	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
360	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
380	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
400	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00
420	0.00	0.00	1.00	1.00	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
440	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
460	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

Initial Supporting table - P219B Variance Threshold Bank2 Table

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

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

y/x	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200
140	0.00	1.25	2.00	1.75	1.75	1.75	1.50	1.50	2.00	1.75	1.50	3.75	1.75	0.00	0.00	0.00	0.00
160	0.00	2.25	2.50	2.00	2.75	2.50	2.00	2.50	2.25	2.25	2.25	4.50	2.25	0.00	0.00	0.00	0.00
180	0.00	3.00	3.00	3.00	3.25	3.00	2.75	3.00	2.25	2.75	2.50	2.75	3.25	0.00	0.00	0.00	0.00
200	0.00	8.50	3.00	3.25	3.25	3.50	2.50	2.25	2.25	2.25	2.25	3.00	3.50	0.00	0.00	0.00	0.00
220	0.00	8.75	3.75	3.75	3.75	3.25	2.75	2.50	3.25	3.00	3.00	4.00	3.75	0.00	0.00	0.00	0.00
240	0.00	0.00	3.75	3.50	3.50	3.00	3.25	3.00	4.25	3.75	4.75	4.25	5.50	0.00	0.00	0.00	0.00
260	0.00	0.00	3.75	3.25	3.50	3.50	4.00	3.50	4.50	4.50	7.00	4.50	6.25	0.00	0.00	0.00	0.00
280	0.00	0.00	3.75	3.75	4.25	3.75	4.25	4.00	5.00	5.00	6.50	5.75	7.00	0.00	0.00	0.00	0.00
300	0.00	0.00	6.25	4.50	4.75	5.00	6.00	4.75	5.75	5.00	7.25	6.25	8.00	0.00	0.00	0.00	0.00
320	0.00	0.00	5.25	5.50	5.75	6.50	6.50	6.25	6.75	5.75	8.00	6.50	8.50	0.00	0.00	0.00	0.00
340	0.00	0.00	6.50	6.25	6.75	6.50	7.50	6.50	6.75	5.75	8.25	6.75	9.25	0.00	0.00	0.00	0.00
360	0.00	0.00	6.75	7.50	7.25	9.50	6.50	8.50	7.25	6.50	7.75	7.00	8.75	0.00	0.00	0.00	0.00
380	0.00	0.00	8.25	9.50	11.75	10.25	7.00	11.50	8.50	7.00	9.75	8.00	9.25	0.00	0.00	0.00	0.00
400	0.00	0.00	9.00	9.00	12.00	12.00	7.75	10.50	9.00	8.75	12.00	42.75	12.75	0.00	0.00	0.00	0.00
420	0.00	0.00	10.50	10.00	0.00	13.50	10.00	11.75	10.50	13.75	15.00	14.25	20.00	0.00	0.00	0.00	0.00
440	0.00	0.00	39.25	10.25	62.50	15.25	12.50	13.75	10.75	15.25	19.75	19.00	26.00	0.00	0.00	0.00	0.00
460	0.00	0.00	0.00	12.00	19.50	16.50	15.00	18.25	14.50	16.50	21.75	22.75	25.25	0.00	0.00	0.00	0.00

Initial Sup. table - P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)

Description: KtFWDD_Cnt_SampleWeigthting: Calibration table that defines the weighting factor used in a sample of the measured transfer case ratio for full range diagnostics, based on vehicle speed and axle torque.

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: KtFWDD_Cnt_SampleWeigthting

y/x	0.00	3.00	5.00	5.10	12.00	15.00	18.00	21.00	24.00
-200.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
-150.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
-100.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
-50.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
150.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
200.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)

Description: LeFWDD_r_RatioHiBound_P279A = KeFWDD_r_TCaseHiRange + KtFWDD_r_TCaseHiRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound_P279A

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
2.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
3.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
4.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
5.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
6.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
7.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
8.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
9.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999

Initial Supporting table - P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)

Description: LeFWDD_r_RatioLoBound_P279A = KeFWDD_r_TCaseHiRange - KtFWDD_r_TCaseHiRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound_P279A

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
2.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
3.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
4.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
5.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
6.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
7.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
8.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
9.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999

Initial Supporting table - P279B Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)

Description: LeFWDD_r_RatioHiBound_P279B = KeFWDD_r_TCaseLoRange + KtFWDD_r_TCaseLoRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound_P279B

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
2.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
3.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
4.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
5.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
6.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
7.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
8.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
9.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998

Initial Supporting table - P279B Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)

Description: LeFWDD_r_RatioLoBound_P279B = KeFWDD_r_TCaseLoRange - KtFWDD_r_TCaseLoRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound_P279B

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
2.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
3.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
4.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
5.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
6.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
7.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
8.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
9.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999

Initial Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 1)

Description: LeFWDD_r_RatioHiBound1_P279C = KeFWDD_r_TCaseHiRange + KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound1_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
2.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
3.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
4.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
5.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
6.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
7.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
8.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
9.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999

Initial Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 2)

Description: LeFWDD_r_RatioHiBound2_P279C = KeFWDD_r_TCaseLoRange + KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound2_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
2.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
3.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
4.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
5.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
6.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
7.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
8.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998
9.00	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998	10.6998

Initial Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 1)

Description: LeFWDD_r_RatioLoBound1_P279C = KeFWDD_r_TCaseHiRange - KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound1_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
2.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
3.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
4.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
5.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
6.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
7.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
8.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
9.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999

Initial Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 2)

Description: LeFWDD_r_RatioLoBound2_P279C = KeFWDD_r_TCaseLoRange - KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound2_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
2.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
3.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
4.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
5.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
6.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
7.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
8.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999
9.00	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999	-5.2999

Initial Supporting table - 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	500	600	700	800	900	1,000	1,200	1,400	1,600
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

Initial Supporting table - 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	500	600	700	800	900	1,000	1,200	1,400	1,600
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

Initial Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	500	600	700	800	900	1,000	1,200	1,400	1,600
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

Initial Supporting table - 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	500	600	700	800	900	1,000	1,200	1,400	1,600
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

Initial Supporting table - 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
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	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
50	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
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	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
50	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
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - 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	3,000	3,500	4,000	4,500	5,000	5,500	6,000	7,000	8,000
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

Initial Supporting table - 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	1,000	1,200	1,600	2,000	2,600	3,500	4,500	5,500	6,500
1	1.40	1.30	1.20	1.20	1.20	1.20	1.20	1.20	1.20

Initial Supporting table - RevMode_Decel

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

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

y/x	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
3	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
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	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	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - 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	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Initial Supporting table - 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	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
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

Initial Supporting table - 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	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
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

Initial Supporting table - 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	1,000	1,200	1,600	2,000	2,600	3,500	4,500	5,500	6,500
0	0.84	1.19	1.28	1.41	1.33	0.77	0.77	0.77	0.87
1	0.84	1.19	1.28	1.41	1.33	0.77	0.77	0.77	0.87
1	0.84	1.19	1.28	1.41	1.33	0.77	0.77	0.77	0.87
1	0.77	1.23	1.30	1.24	1.03	1.14	0.77	0.81	0.96
1	0.77	1.13	1.37	1.33	0.83	1.42	1.53	1.92	1.29
2	0.77	0.94	1.34	1.19	0.90	1.38	2.09	1.91	2.00
2	0.77	0.94	1.17	1.05	1.12	1.21	1.82	2.00	2.25
4	0.77	0.94	1.10	1.05	1.16	1.21	1.82	2.13	2.25
8	0.77	0.94	1.10	1.05	1.16	1.21	1.82	2.13	2.25

Initial Supporting table - 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

Initial Supporting table - WaitToStart

Description: Number of engine cycles to delay if diesel engine is cranked before wait to start lamp is extinguished. This lookup table determines the delay length by taking into account the coolant temperature.

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

y/x	-20	-10	0	10	20	30	40	50	60
1	0	0	0	0	0	0	0	0	0

Initial Supporting table - WSSRoughRoadThres

Description: 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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - ZeroTorqueAFM

Description: Zero torque engine load while in Active Fuel Management. %of Max Brake Torque along the Neutral rev line, as a function of RPM and Baro

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

ZeroTorqueAFM - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
65	31.99	31.00	30.00	30.00	30.00	30.00	30.00	30.00	20.00	18.99	18.00	17.00	20.00
75	31.99	31.00	30.00	30.00	30.00	30.00	30.00	30.00	20.00	18.99	18.00	17.00	20.00
85	31.99	31.00	30.00	30.00	30.00	30.00	30.00	30.00	20.00	18.99	18.00	17.00	20.00
95	31.99	31.00	30.00	30.00	30.00	30.00	30.00	30.00	20.00	18.99	18.00	17.00	20.00
105	31.99	31.00	30.00	30.00	30.00	30.00	30.00	30.00	20.00	18.99	18.00	17.00	20.00

ZeroTorqueAFM - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
65	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
75	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
85	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
95	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
105	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Initial Supporting table - ZeroTorqueEngLoad

Description: %of Max Brake Torque that represents Zero Brake torque along the Neutral rev line, as a function of RPM and Baro

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

ZeroTorqueEngLoad - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
65	1.75	1.00	0.50	0.20	0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.15	-0.15	-0.15
75	1.75	1.00	0.50	0.20	0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.15	-0.15	-0.15
85	-1.20	-1.20	-1.80	-2.20	-2.20	-1.80	-1.20	-1.20	-1.20	-1.12	-1.12	-1.12	-1.11
95	4.00	2.50	1.75	1.20	0.65	0.30	0.00	-0.20	-0.29	-0.30	-0.33	-0.38	-0.40
105	4.00	2.50	1.75	1.20	0.65	0.30	0.00	-0.20	-0.29	-0.30	-0.33	-0.38	-0.40

ZeroTorqueEngLoad - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
65	-0.15	-0.15	-0.15	-0.10	0.20	1.37	2.55	3.72	4.89	6.06	7.23	8.40	9.58
75	-0.15	-0.15	-0.15	-0.10	0.20	1.47	2.74	4.01	5.28	6.54	7.81	9.08	10.35
85	-1.12	-1.00	-1.00	-1.11	-1.00	0.43	1.86	3.28	4.71	6.13	7.56	8.99	10.42
95	-0.40	-0.43	-0.48	-0.10	0.50	1.74	2.98	4.22	5.46	6.70	7.93	9.17	10.41
105	-0.40	-0.43	-0.48	-0.10	0.50	1.74	2.98	4.22	5.46	6.70	7.93	9.17	10.41

Initial 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	2,048	2,048
CiFCLP_Idle	2,048	2,048
CiFCLP_Cruise	2,048	2,048
CiFCLP_LightAccel	2,048	2,048
CiFCLP_HeavyAccel	2,048	2,048

Initial Supporting table - Closed Loop Enable Clarification - KcFCLP_Cnt_O2RdyCyclesThrsh

Description: Number of 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

Initial Supporting table - Closed Loop Enable Clarification - KcFULC_O2_SensorReadyEvents

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

Notes: Time (events * 12.5 milliseconds)

y/x	1
1	10

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_dm_IntegrationAirflowMax

Description: Maximum allowed estimated airflow for post O2 integral terms to be updated.

Notes: Grams per Second

y/x	1
1	512

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_Pct_CatAccuSlphrPostDsbl

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

Notes: Percent

y/x	1
1	255

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_T_IntegrationCatalystMax

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

Notes: Modeled catalyst Temperature in Celcius

y/x	1
1	1,000

Initial Supporting table - Closed Loop Enable Clarification - KeFCLP_T_IntegrationCatalystMin

Description: Minimum allowed estimated catalytic converter temperature to begin using post 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	450

Initial Supporting table - Closed Loop Enable Clarification - KfFCLL_T_AdaptiveHiCoolant

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

Notes: Degrees Celcius

y/x	1
1	255

Initial Supporting table - Closed Loop Enable Clarification - KfFCLL_T_AdaptiveLoCoolant

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

Notes: Degrees Celcius

y/x	1
1	55

Initial Supporting table - Closed Loop Enable Clarification - KfFCLP_U_O2ReadyThrshLo

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

Notes: Voltage in millivolts

y/x	1
1	1,100

Initial Supporting table - Closed Loop Enable Clarification - KtFCLL_p_AdaptiveLowMAP_Limit

Description: KtFCLL_p_AdaptiveLowMAP_Limit

Notes: MAP in KPa

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

Initial Supporting table - Closed Loop Enable Clarification - KtFCLP_t_PostIntgIDisableTime

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	100.0	100.0	100.0	100.0	75.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

Initial Supporting table - Closed Loop Enable Clarification - KtFCLP_t_PostIntgIRampInTime

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	50.0	50.0	50.0	45.0	40.0	40.0	40.0	40.0	30.0	25.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Initial Supporting table - Closed Loop Enable Clarification - KtFSTA_t_ClosedLoopAutostart

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

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	320.0	225.0	190.0	130.0	70.0	21.0	21.0	21.0	21.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

Initial Supporting table - Closed Loop Enable Clarification - KtFSTA_t_ClosedLoopTime

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

Notes: Time in seconds

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	320.0	225.0	190.0	130.0	70.0	21.0	21.0	21.0	21.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

Initial Supporting table - P0234_KtBSTD_p_CntrlDevBasLim

Description: Overboost in open loop diagnose failure limit.

Notes:

y/x	60.00	70.00	80.00	90.00	95.00	110.00
1,500.00	65.300	65.300	58.600	51.900	45.200	45.200
2,500.00	46.540	39.840	26.440	25.100	25.100	25.100
3,000.00	33.140	21.750	11.700	11.700	11.700	11.700
4,000.00	15.000	11.700	11.700	11.700	11.700	11.700
5,000.00	15.000	11.700	11.700	11.700	11.700	11.700
6,000.00	15.000	11.700	11.700	11.700	11.700	11.700

Initial Supporting table - P0299_KtBSTD_p_CntrlDevDsrdRtHi

Description: Allowed positive rate limit on desired boost pressure. In allowed kPa per 100 ms.

Notes:

y/x	1,000	1,500	1,900	2,500	3,000	3,500	4,000	4,500	5,500	6,500
1	0.195	0.265	0.449	1.560	1.976	2.080	2.080	2.080	2.080	2.080

Initial Supporting table - P0299_KtBSTD_p_CntrlDevDsrdRtLo

Description: Allowed negative rate limit on desired boost pressure. In allowed kPa per 100 ms.

Notes:

y/x	1,000	1,500	1,900	2,500	3,000	3,500	4,000	4,500	5,500	6,500
1	-200.00	-200.00	-200.00	-200.00	-200.00	-200.00	-200.00	-200.00	-200.00	-200.00

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

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

Notes: KtEONV_t_VolatilityTimeMax

y/x	-10	-4	1	7	13	18	24	29	35	41	46	52	58	63	69	74	80
1	30	30	45	60	80	120	220	300	400	400	400	400	400	400	400	400	400

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

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

Notes: KtEONV_t_EngOffTimeBefVehOffMax

y/x	-10	-4	1	7	13	18	24	29	35	41	46	52	58	63	69	74	80
1	44	44	44	44	68	82	105	153	320	480	480	480	480	480	480	480	480

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

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

Notes: KtEONV_p_PressureThreshold

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
2	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
3	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
4	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
5	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
7	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
8	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
9	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
10	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
11	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
12	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
13	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
14	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
15	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
16	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6
17	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6	-373.6

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

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

Notes: KtOATC_t_EstIdleCondTimePreset

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

y/x	0	600	1,200	1,800	2,400	3,000	3,600	4,200	4,800	5,400	6,000	6,600	7,200	7,800	8,400	9,000	9,600
1	200	220	250	250	250	220	220	200	200	200	200	200	190	180	180	180	180

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

y/x	10,200	10,800	11,700	12,600	13,500	14,400	15,300	16,200	17,100	18,000	19,200	20,400	21,600	22,800	24,000	25,200	
1	170	170	150	150	150	150	140	140	140	140	120	120	120	120	120	120	

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

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

Notes: KtEVPD_t_PVLT_EngineVacTimeCold

y/x	0	6	12	19	25	31	37	44	50	56	62	69	75	81	87	94	100
1	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60

Initial 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

Initial 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

Initial Supporting table - CalculatedPerfMaxEc1

Description:

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
3	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
4	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
7	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
9	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
11	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
12	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
13	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
14	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
15	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
16	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
17	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

Initial Supporting table - CalculatedPerfMaxEc2

Description:

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
3	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
4	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
7	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
9	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
11	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
12	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
13	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
14	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
15	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
16	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
17	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

Initial Supporting table - CalculatedPerfMaxIc1

Description:

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
3	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
4	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
7	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
9	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
11	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
12	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
13	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
14	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
15	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
16	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
17	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

Initial Supporting table - CalculatedPerfMaxIc2

Description:

Notes:

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

Initial Supporting table - P0324_PerCyl_ExcessiveKnock_Threshold

Description: Fail threshold for the Knock Performance per-cylinder Excessive Knock Diagnostic

Notes: Used for P0324. Cal Name: KtKNKD_k_PerfCylFiltKnkIntThrsh. X-axis = Engine Speed (RPM), Diagnostic fails when VaKNKD_k_PerCylKnockIntFilt[cyl] > KtKNKD_k_PerfCylFiltKnkIntThrsh

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	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Initial Supporting table - P0325_P0330_OpenCktThrshMax (20 kHz)

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

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

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

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	11.1191	11.0664	11.0078	10.9961	11.0098	11.0039	10.7676	10.7832	10.5918	10.3711	9.6934	9.1836	8.6094	8.6094	8.6094	8.6094	8.6094

Initial Supporting table - P0325_P0330_OpenCktThrshMax (Normal Noise)

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

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

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

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6680	1.0840	1.4980	1.9141	2.3301	2.7461	3.1602	3.5762

Initial Supporting table - P0325_P0330_OpenCktThrshMin (20 kHz)

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

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

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

y/x	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500
1	3.8965	3.8809	3.8535	3.8574	3.8672	3.8633	3.7559	3.7871	3.6836	3.6523	3.4316	3.2383	3.1055	3.1074	3.1074	3.1074	3.1074

Initial Supporting table - P0325_P0330_OpenCktThrshMin (Normal Noise)

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

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

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

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6426	0.7090	0.7773	0.8438	0.9121	0.9785	1.0449	1.1133

Initial Supporting table - P0325_P0330_OpenMethod_2

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

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

Selects 1 of 3 available methods: "20kHz Method", "Normal Noise Method," or "None" (note: "None" = disabled at that rpm). The mode chosen dictates which set of threshold tables are used. Typically, either: A) the 20 kHz Method is used for all RPM or B) the 20 kHz Method is used for low/medium RPM and the Normal Noise Method is used for high RPM.

P0325_P0330_OpenMethod_2 - Part 1

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

P0325_P0330_OpenMethod_2 - Part 2

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

P0325_P0330_OpenMethod_2 - Part 3

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

P0325_P0330_OpenMethod_2 - Part 4

y/x	15	16			
1	CeKNKD_e_Open_20KHz	CeKNKD_e_Open_20KHz			

Initial Supporting table - P0326_P0331_AbnormalNoise_CylsEnabled

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

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	0	0

Initial Supporting table - 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	0.019	0.356	0.364	0.354	0.373	0.360	0.384	0.454	0.489	0.616	0.608	0.623	0.623	0.623	0.623	0.623	0.623

Initial Supporting table - P0521_LowMinOilPresFail - Two Stage Oil Pump

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	50.0	64.0	76.0	90.0	104.0	118.0	130.0	136.0	142.0

Initial Supporting table - P0521_P06DD_P06DE_OP_HiStatePressure

Description: Two Stage Oil Pump Oil Pressure in High State

Notes: For P0521, 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	40.0	50.0	60.0	70.0	80.0	90.0	100.0	110.0	120.0
1,000.0	413.0	383.0	352.0	322.0	292.0	262.0	232.0	201.0	174.0
1,500.0	483.0	456.0	429.0	402.0	374.0	347.0	320.0	393.0	265.0
2,000.0	524.0	500.0	477.0	453.0	429.0	405.0	382.0	358.0	334.0
2,500.0	549.0	530.0	510.0	491.0	471.0	452.0	432.0	413.0	393.0
3,000.0	561.0	545.0	529.0	513.0	497.0	481.0	465.0	449.0	433.0
3,500.0	569.0	556.0	543.0	531.0	518.0	505.0	492.0	480.0	467.0
4,000.0	572.0	562.0	552.0	542.0	532.0	522.0	512.0	502.0	492.0
4,500.0	573.0	565.0	558.0	550.0	542.0	535.0	527.0	520.0	512.0
5,000.0	575.0	570.0	564.0	558.0	552.0	546.0	540.0	534.0	528.0

Initial Supporting table - P0531_Coolant_Weighting_Factor

Description: Coolant Weighting Factor for Delta Predicted AC Pressure

Notes: For P0531: KtACCD_k_HSPRat_EngageCoolCoeff with X Axis is Engine Coolant defined by KnACCD_T_HSPRat_EngageTstCool to weight the Delta Predicted Pressure

y/x	-35	-18	0	18	35	53	70	88	105
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P0531_Delta_Predicted_ Pressure

Description: AC High Side Pressure Sensor Sensor Engage Test Predicted Delta Pressure

Notes: For P0531: KtACCD_p_HSPR_DeltaPredicted with X Axis is defined by KnACCD_T_HSPRat_EngageTstAmb and Y Axis is defined by KnACCD_v_HSPRat_EngageTstVehSpd

y/x	-35	-18	0	18	35	53	70	88	105
0	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
20	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
40	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
60	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
80	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
100	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
120	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
140	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
160	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00

Initial Supporting table - P0531_Delta_Predicted_Quality_Factor

Description: Delta Predicted Qualtiy Factor for the Engage Test

Notes: For P0531: KtACCD_k_HSPR_QualFactor with X Axis is defined by KnACCD_T_HSPRat_EngageTstAmb and Y Axis is defined by KnACCD_v_HSPRat_EngageTstVehSpd

y/x	-35	-18	0	18	35	53	70	88	105
0	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
20	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
40	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
60	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
80	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
100	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
120	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
140	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
160	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998

Initial Supporting table - P0531_FanSpeed_Weighting_Factor

Description: FanSpeed Weighting Factor for Delta Predicted AC Pressure

Notes: For P0531: KtACCD_k_HSPRat_EngageFanCoeff with X Axis is Fan Speed as desfined by KnACCD_Pct_HSPRat_EngageTestFan to weight the Delta Predicted Pressure

y/x	0	12	24	36	48	60	72	84	100
1	1	1	1	1	1	1	1	1	1

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

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

Notes: P0606, KaPISD_b_ProgSeqWatchEnbl

y/x	CeTSKR_e_CPU	CeTSKR_e_CPU2	CeTSKR_e_CPU3	CeTSKR_e_CPU4
CePISR_e_6p25msSeq	1	0	0	0
CePISR_e_12p5msSeq	1	0	0	0
CePISR_e_25msSeq	1	0	0	0
CePISR_e_LORES_C	1	0	0	0

Initial Supporting table - P06B6_P06B7_OpenTestCktThrshMax

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

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	0.281	0.287	0.291	0.350	0.387	0.490	0.447	0.588	0.586	0.715	0.713	0.703	0.703	0.703	0.703	0.703	0.703

Initial Supporting table - P06B6_P06B7_OpenTestCktThrshMin

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

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	0.131	0.133	0.137	0.158	0.172	0.215	0.197	0.297	0.295	0.361	0.373	0.373	0.373	0.373	0.373	0.373	0.373

Initial 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	0.0	0.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0

Initial 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	20.0	20.0	20.0	20.0	20.0	0.0	0.0

Initial Supporting table - P06DD_P06DE_MinOilPressThresh

Description: Intrusive diagnostic minimum pressure limit that is a function of Engine Speed and Oil Temperature

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

y/x	40	50	60	70	80	90	100	110	120
1,000	25	32	38	45	52	59	65	68	71
1,500	25	32	38	45	52	59	65	68	71
2,000	25	32	38	45	52	59	65	68	71
2,500	25	32	38	45	52	59	65	68	71
3,000	25	32	38	45	52	59	65	68	71
3,500	25	32	38	45	52	59	65	68	71
4,000	25	32	38	45	52	59	65	68	71
4,500	25	32	38	45	52	59	65	68	71
5,000	25	32	38	45	52	59	65	68	71

Initial 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	40	50	60	70	80	90	100	110	120
1,000	299	283	268	252	237	221	205	190	174
1,500	325	312	299	286	273	260	248	235	222
2,000	343	333	324	314	305	295	285	276	266
2,500	356	350	343	337	331	324	318	312	305
3,000	363	359	355	352	348	344	341	337	333
3,500	363	361	360	358	356	355	353	351	349
4,000	363	361	360	358	356	355	353	351	349
4,500	363	361	360	358	356	355	353	351	349
5,000	363	361	360	358	356	355	353	351	349

Initial 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	40.0	50.0	60.0	70.0	80.0	90.0	100.0	110.0	120.0
1,000.0	80.0	50.0	42.0	35.0	28.0	21.0	14.0	6.0	0.0
1,500.0	79.0	72.0	65.0	58.0	51.0	44.0	36.0	29.0	22.0
2,000.0	91.0	84.0	77.0	70.0	62.0	55.0	49.0	41.0	34.0
2,500.0	97.0	90.0	84.0	77.0	70.0	64.0	57.0	51.0	44.0
3,000.0	99.0	93.0	87.0	81.0	75.0	69.0	62.0	56.0	50.0
3,500.0	103.0	98.0	92.0	87.0	81.0	75.0	70.0	65.0	59.0
4,000.0	105.0	101.0	96.0	92.0	88.0	84.0	80.0	76.0	72.0
4,500.0	105.0	102.0	99.0	96.0	93.0	90.0	87.0	85.0	82.0
5,000.0	106.0	105.0	102.0	100.0	98.0	96.0	94.0	92.0	90.0

Initial Supporting table - P156A_Off_Test_Delay

Description: Delay time for AC High Side Pressure Rationality

Notes: For P156A: KtACCD_t_HSP_RatOffTestDelay with X axis Ambient Temperature defined by KnACCD_T_HSP_RatOffTestPresMax

y/x	-20.0	0.0	20.0	60.0	100.0
1.0	20.0	20.0	20.0	20.0	20.0

Initial Supporting table - P156A_Off_Test_Threshold

Description: AC High Side Pressure Sensor Rationality Off Test Threshold

Notes: For P156A: KtACCD_p_HSPRat_OffTestPresMax with X Axis is defined by KnACCD_T_HSPRat_OffTestPresMax

y/x	-20	0	20	60	100
1	300	350	400	450	500

Initial Supporting table - P156B_On_Test_Threshold

Description: AC High Side Pressure Sensor Rationality On Test Threshold

Notes: For P156B: KtACCD_p_HSPRat_OnTestPresMin with X Axis is defined by KnACCD_T_HSPRat_OnTestPresMin

y/x	0	25	45	70	100
1	300.0	350.0	400.0	450.0	500.0

Initial Supporting table - P156C_Cold_Test_Threshold

Description: AC High Side Pressure Sensor Rationality Cold Test Threshold

Notes: For P156C: KtACCD_p_HSPRat_ColdTestTarget with X Axis is defined by KnACCD_T_HSPRat_ColdTestTarget

y/x	-20	0	20	60	100
1	300	350	400	450	500

Initial Supporting table - DFCO_CoolEnblHi_Temp

Description:

Notes:

y/x	-40	0	25
1	30.0	30.0	30.0

Initial Supporting table - DFCO_DelayAfterStart_Time

Description:

Notes:

y/x	-30	-10	20	60	90
1	20.0	15.0	10.0	8.0	5.0

Initial Supporting table - DFCO_DsblLo_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	512	512
CeTGRR_e_TransGr2	0	0
CeTGRR_e_TransGr3	0	0
CeTGRR_e_TransGr4	0	0
CeTGRR_e_TransGr5	0	0
CeTGRR_e_TransGr6	0	0
CeTGRR_e_TransGrEVT1	512	512
CeTGRR_e_TransGrEVT2	512	512
CeTGRR_e_TransGrNeut	512	512
CeTGRR_e_TransGrRvrs	512	512
CeTGRR_e_TransGrPark	512	512
CeTGRR_e_TransGr7	512	512
CeTGRR_e_TransGr8	512	512

Initial Supporting table -DFCO_EnblHi_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	512.0	512.0
CeTGRR_e_TransGr2	0.0	0.0
CeTGRR_e_TransGr3	0.0	0.0
CeTGRR_e_TransGr4	0.0	0.0
CeTGRR_e_TransGr5	0.0	0.0
CeTGRR_e_TransGr6	0.0	0.0
CeTGRR_e_TransGrEVT1	512.0	512.0
CeTGRR_e_TransGrEVT2	512.0	512.0
CeTGRR_e_TransGrNeut	512.0	512.0
CeTGRR_e_TransGrRvrs	512.0	512.0
CeTGRR_e_TransGrPark	512.0	512.0
CeTGRR_e_TransGr7	512.0	512.0
CeTGRR_e_TransGr8	512.0	512.0

Initial Supporting table - DFCO_EngSpdEnblOfst

Description:

Notes:

y/x	-1,750	-1,500	-1,250	-1,000	-750	-500	-300	-100	0
1	100	100	100	50	0	0	0	0	0

Unique Supporting table - Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests

Description: KaPOPD_PostCellEnbl - A table of adaptive (Block Learn) cells in which to enable the post oxygen sensor tests.

Notes: Note: When Table column headings match the calibration value below it, that indivdual cell is enabled.

Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 1				
y/x	0	1	2	3
1	0	7	7	7
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 2				
y/x	4	5	6	7
1	7	7	7	7
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 3				
y/x	8	9	10	11
1	8	15	15	15
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 4				
y/x	12	13	14	15
1	15	15	15	15

Unique Supporting table - P0011_P0021_P05CC_P05CD_EngOilPressEnblIc

Description: Delay time before the oil pressure enable flag is set assuming all the oil pressure enable criteria are met

Notes: KtPHSC_t_EngOilPressEnblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	5	5	5	4	4	4	4	2	1	1	1	1	1	1	3	3	3

Unique Supporting table - P0011_P0021_P05CC_P05CD_LoPresHiEnbllc

Description: Intake cam is enabled when oil pressure exceeds this value

Notes: KtPHSC_p_LoPresHiEnblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155

Unique Supporting table - P0011_P0021_P05CC_P05CD_LoPresLoDsbllc

Description: Intake cam is disabled when oil pressure falls below this value

Notes: KtPHSC_p_LoPresLoDsbllc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145

Unique Supporting table - P0011_P0021_P05CC_P05CD_LoRpmLoDsblIc

Description: Intake cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800

Unique Supporting table - P0011_P0021_P05CC_P05CD_P0014_P0024_P05CE_P05CF_ColdStartEngRunning

Description: Engine running time must be greater than this threshold during a cold start to enable cam phasing

Notes: KtPHSR_t_ColdStartEngRunning

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	30	15	4	4	4	3	3	3	2	1	1	1	1	2	2	2	2

Unique Supporting table - P0014_P0024_P05CE_P05CF_EngOilPressEnblEc

Description: Delay time before the oil pressure enable flag is set assuming all the oil pressure enable criteria are met

Notes: KtPHSC_t_EngOilPressEnblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2

Unique Supporting table - P0014_P0024_P05CE_P05CF_LoPresHiEnblEc

Description: Exhaust cam is enabled when oil pressure exceeds this value

Notes: KtPHSC_p_LoPresHiEnblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155

Unique Supporting table - P0014_P0024_P05CE_P05CF_LoPresLoDsblEc

Description: Exhaust cam is disabled when oil pressure falls below this value

Notes: KtPHSC_p_LoPresLoDsblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145

Unique Supporting table - P0014_P0024_P05CE_P05CF_LoRpmLoDsblEc

Description: Exhaust cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800

Unique Supporting table - P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold

Description: P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold

Notes: KtPHSC_t_RtnHomeDlyLmt

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	300	300	7	5	4	4	4	3	3	2	2	2	2	2	2	2	2

Unique Supporting table - P00C4_P2261_KtBSTD_r_SurgeLim

Description: Turbo compressor bypass valve diagnosis surge area limit.

Notes:

y/x	5.00	10.00	25.00	50.00	150.00	200.00
1	1.000	1.100	1.250	2.600	2.900	3.000

Unique 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	500	1,000	1,250	1,500	1,750	2,000	2,250	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Unique 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	500	1,000	1,250	1,500	1,750	2,000	2,250	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Unique Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAP3 Residual Weight Factor based on RPM

Notes:

y/x	0	400	800	1,200	1,600	2,000	2,400	2,800	3,200	3,600	4,000	4,400	4,800	5,200	5,600	6,000	6,500
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Unique 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	500	1,000	1,250	1,500	1,750	2,000	2,250	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max Air Flow

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	2.6	3.3	4.5	5.4	7.0	8.8	11.0	12.4	12.4

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max MAP

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	34.1	27.3	26.1	25.4	25.7	24.1	29.5	29.4	29.4

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Offset

Notes:

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

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min Air Flow

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	15.0	27.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min MAP

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	124.0	126.0	127.0	128.0	129.0	128.0	127.0	127.0	127.0

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Offset

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	1.0	1.0	1.0	1.0	2.0	2.0	2.0	3.0	3.0

Unique Supporting table -P0234_KtBSTD_p_CntrlDevNegLim

Description: Negative boost pressure control deviation fail limit.

Notes:

y/x	5.00	50.00	100.00	150.00	200.00	250.00	300.00	350.00	400.00	450.00
1,000	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-20.00	-20.00
1,500	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-10.00	-10.00
2,000	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2,500	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
3,000	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
3,500	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
4,000	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
4,500	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
5,000	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-30.00	-40.00
6,000	-30.00	-30.00	-20.00	-20.00	-20.00	-20.00	-30.00	-40.00	-50.00	-50.00

Unique Supporting table - P0234_P0299_KtBSTD_p_CntrlDevAmbAirCorr

Description: Additative offset on boost pressure control deviation fail limit.

Notes:

y/x	60.00	70.00	80.00	90.00	100.00	110.00
1,000	20.00	15.00	10.00	5.00	0.00	0.00
2,000	15.00	10.00	5.00	0.00	0.00	0.00
3,000	10.00	5.00	0.00	0.00	0.00	0.00
4,000	10.00	5.00	0.00	0.00	0.00	0.00
5,000	15.00	10.00	5.00	0.00	0.00	0.00
6,000	20.00	15.00	10.00	5.00	0.00	0.00

Unique Supporting table - P0234_P0299_KtBSTD_t_CntrlDevEnblDelay

Description: Timer to stabilize enable conditions for over and underboost diagnosis.

Notes:

y/x	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	6,000
1	1.7500	1.5000	1.3750	1.1250	1.0000	0.8750	0.7500	0.6250	0.5000	0.5000

Unique Supporting table - P0299_KtBSTD_p_CntrlDevPosLim

Description: Positive boost pressure control deviation fail limit.

Notes:

y/x	5.00	50.00	100.00	150.00	200.00	250.00	300.00	350.00	400.00	450.00
1,000	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	20.00	20.00
1,500	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	10.00	10.00
2,000	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
2,500	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
3,000	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
3,500	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
4,000	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
4,500	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
5,000	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	30.00	40.00
6,000	30.00	30.00	20.00	20.00	20.00	20.00	30.00	40.00	50.00	50.00

Unique Supporting table - P226B_KtBSTD_r_ExcsvBstPresLim

Description: Compressor pressure ratio fail limit for excessive boost pressure diagnosis.

Notes:

y/x	100.000	130.000	160.000	185.000	200.000	215.000	225.000	235.000
1	3.000	2.530	2.006	1.835	1.680	1.523	1.394	1.206

Unique Supporting table - 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

VCE_ECOMode_MaxTorque_Gr5 - Part 1

y/x	800	888	976	1,064	1,152	1,240	1,328	1,416	1,504	1,592	1,680	1,768	1,856
1	10	25	25	120	130	135	145	155	150	145	140	140	140

VCE_ECOMode_MaxTorque_Gr5 - Part 2

y/x	1,944	2,032	2,120	2,208	2,296	2,384	2,472	2,560	2,648	2,736	2,824	2,912	3,000
1	140	140	130	120	110	110	110	110	110	110	110	110	110

Unique Supporting table -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.

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	1,000	1,000	1,000	1,000	1,000	1,000	1,000

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	1,000	1,000	1,000	1,000	800	800	

Unique Supporting table - 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.

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	2,850	2,850	2,850	2,850	2,850	2,850	2,850

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	2,850	2,850	2,850	2,850	2,850	2,850	

Unique Supporting table - VCE_MinVacReducedTorqMode

Description: Minimum Vacuum allowed in VCE mode

Notes: For P3400: KtVCEC_p_MinVacReducedTrqMode

VCE_MinVacReducedTorqMode - Part 1									
y/x	800	888	976	1,064	1,152	1,240	1,328	1,416	1,504
1	30.6	21.8	17.0	14.2	11.6	9.5	8.2	7.1	5.9

VCE_MinVacReducedTorqMode - Part 2									
y/x	1,592	1,680	1,768	1,856	1,944	2,032	2,120	2,208	2,296
1	5.1	4.4	4.0	3.6	3.4	3.2	3.0	3.1	3.8

VCE_MinVacReducedTorqMode - Part 3									
y/x	2,384	2,472	2,560	2,648	2,736	2,824	2,912	3,000	
1	5.1	5.8	5.7	5.8	6.0	5.6	4.1	3.0	

Unique Supporting table - 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

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	15	15	15	15	15	15	15

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	

Unique Supporting table - 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

VCE_NormalMode_MaxTorque_Gr5 - Part 1

y/x	800	888	976	1,064	1,152	1,240	1,328	1,416	1,504	1,592	1,680	1,768	1,856
1	10	25	25	120	130	135	145	155	150	145	140	140	140

VCE_NormalMode_MaxTorque_Gr5 - Part 2

y/x	1,944	2,032	2,120	2,208	2,296	2,384	2,472	2,560	2,648	2,736	2,824	2,912	3,000
1	140	140	130	120	110	110	110	110	110	110	110	110	110

Unique Supporting table - 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

Unique Supporting table - VCE_StartUpDelayTime

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

Unique Supporting table - 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	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE

Unique Supporting table - 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

Unique 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	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	100.00
1.00	15.55	17.45	27.99	35.47	49.94	255.00	255.00	255.00	255.00

Unique 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	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	100.00
1.00	28.06	11.51	21.01	19.09	19.63	255.00	255.00	255.00	255.00

Unique 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

Unique 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	500	1,000	1,250	1,500	1,750	2,000	2,250	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Unique Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on MAF Est

Description: P0101_P0106_P010B_P0121_P0236_P1101 MAF2 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

Unique Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest1

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

y/x	-16	-4	8	20	32	44	68
1	11,515	10,288	9,061	7,833	6,606	5,378	4,150

Unique Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest0

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

y/x	-16	-4	8	20	32	44	68
1	14,182	12,877	11,571	10,265	8,958	7,653	5,041

Unique 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

Unique 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	11.51	11.51	11.51	11.51	11.51	11.51

Unique 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	30.69	25.91	19.83	15.61	15.27	16.50	16.38	15.14	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
160.00	125.00	23.05	20.22	17.17	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
240.00	125.00	18.06	16.34	15.22	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
320.00	125.00	15.09	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
400.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
480.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
560.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
640.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
720.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
800.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
880.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
960.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,040.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,120.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,200.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,280.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,360.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00

Unique 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
350.00	280.25	280.25	280.25	280.25	280.25	228.86
450.00	280.25	280.25	280.25	280.25	280.25	183.23
550.00	280.25	280.25	280.25	280.25	230.65	147.09
600.00	280.25	280.25	280.25	280.25	212.20	119.76
700.00	280.25	280.25	280.25	280.25	188.00	89.73
800.00	280.25	280.25	280.25	280.25	156.32	78.11
900.00	280.25	280.25	280.25	280.25	130.64	77.42
1,000.00	280.25	264.81	260.03	280.25	120.78	75.16
1,100.00	280.25	243.67	259.98	280.25	119.23	73.79
1,200.00	253.38	234.11	260.14	280.25	117.89	73.11
1,300.00	229.24	221.33	236.27	262.52	98.77	62.80
1,400.00	223.38	215.99	232.24	258.49	95.91	62.54
2,000.00	180.64	182.61	208.89	235.14	80.45	55.80
2,500.00	158.78	160.90	186.81	213.06	69.97	45.95
3,000.00	116.17	117.84	143.42	169.67	49.17	27.46
4,000.00	73.44	74.87	100.30	126.55	26.23	6.69
6,000.00	42.39	43.34	68.16	94.41	0.41	-19.15

Unique Supporting table - 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	500	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	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
12	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
16	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20	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
24	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
30	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
40	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
60	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
100	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

Unique Supporting table - 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	500	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
8	-0.84	-0.84	-0.84	-0.84	-0.84	-0.82	-0.81	-0.79	-0.81	-0.79	-0.73	-0.65	-0.57	-0.57	-0.57	-0.57	-0.57
12	-0.95	-0.95	-0.95	-0.95	-0.95	-0.93	-0.92	-0.91	-0.90	-0.88	-0.84	-0.81	-0.77	-0.77	-0.77	-0.77	-0.77
16	-1.06	-1.06	-1.06	-1.06	-1.06	-1.04	-1.03	-1.01	-0.98	-0.94	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
20	-1.19	-1.19	-1.19	-1.19	-1.19	-1.15	-1.11	-1.07	-1.03	-0.95	-0.92	-0.92	-0.92	-0.92	-0.92	-0.92	-0.92
24	-1.27	-1.27	-1.27	-1.27	-1.27	-1.20	-1.14	-1.08	-1.05	-0.97	-0.92	-0.92	-0.92	-0.92	-0.92	-0.92	-0.92
30	-1.30	-1.30	-1.30	-1.30	-1.30	-1.22	-1.14	-1.05	-1.05	-0.98	-0.91	-0.91	-0.91	-0.91	-0.91	-0.91	-0.91
40	-1.32	-1.32	-1.32	-1.32	-1.32	-1.24	-1.15	-1.07	-1.08	-1.00	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90
60	-1.32	-1.32	-1.32	-1.32	-1.32	-1.24	-1.15	-1.07	-1.08	-1.00	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90
100	-1.32	-1.32	-1.32	-1.32	-1.32	-1.24	-1.15	-1.07	-1.08	-1.00	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90

Unique Supporting table - 1stFireAfterMisJerkAFM

Description: Multiplier for establishing the expected jerk of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

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

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

Unique Supporting table - 1stFireAftrMisAcelAFM

Description: Multiplier for establishing the expected acceleration of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

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

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
100	0	0	0	0	0	0	0	0	0

Unique Supporting table -Abnormal Cyl 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	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00

Unique Supporting table - 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	1,000	1,200	1,600	2,000
6	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
8	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
10	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
18	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
24	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
30	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
40	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
60	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
77	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50

Unique Supporting table - 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	1,000	1,200	1,600	2,000
6	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
8	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
10	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
18	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
77	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15

Unique Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
6	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
8	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
10	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
18	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
24	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
30	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
40	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
60	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
77	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50

Unique Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
6	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10
8	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10
10	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10
18	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10
24	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10
30	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10
40	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10
60	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10
77	1.40	1.30	1.20	1.10	1.00	1.10	1.20	1.20	1.20	1.13	1.10	1.10	1.10	1.10	1.10	1.10	1.10

Unique Supporting table - 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	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
10	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
20	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
30	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
40	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
50	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
60	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
70	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
80	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
90	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
100	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0

Unique Supporting table - 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	1.02	1.33	1.31	1.48	1.54	1.36	1.32	1.50	1.50
12	1.02	1.33	1.31	1.48	1.54	1.36	1.32	1.50	1.50
16	1.09	0.97	0.96	1.08	1.05	1.00	1.00	1.09	1.09
20	0.99	0.76	0.76	0.76	0.69	0.68	0.64	0.71	0.71
24	0.90	0.71	0.71	0.70	0.62	0.63	0.58	0.62	0.62
30	0.85	0.75	0.68	0.75	0.65	0.75	0.71	0.70	0.70
40	0.78	0.79	0.67	0.75	0.69	0.78	0.78	0.76	0.76
60	0.59	0.62	0.61	0.66	0.78	0.74	0.75	0.77	0.77
98	0.51	0.51	0.52	0.53	0.63	0.65	0.67	0.72	0.72

Unique Supporting table - 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	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
12	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
16	2.59	3.00	3.00	2.27	1.99	2.11	2.18	2.18	2.18
20	1.91	2.39	2.14	1.24	1.19	1.31	1.39	1.39	1.39
24	1.49	1.82	1.45	0.70	0.88	0.95	1.01	1.01	1.01
30	1.28	1.47	1.18	0.60	0.80	0.85	0.90	0.90	0.90
40	1.06	1.20	0.93	0.57	0.80	0.85	0.90	0.90	0.90
60	0.85	0.95	0.86	0.56	0.80	0.85	0.90	0.90	0.90
98	0.80	0.90	0.86	0.55	0.80	0.85	0.90	0.90	0.90

Unique Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
6	1.00	0.99	0.98	0.96	0.95	0.94	0.92	0.84	0.67	0.66	0.68	0.75	0.71	0.65	0.65	0.68	0.70
8	1.00	0.97	0.94	0.91	0.88	0.90	0.92	0.84	0.67	0.66	0.68	0.75	0.71	0.65	0.65	0.68	0.70
10	1.00	0.99	0.99	0.98	0.97	0.95	0.92	0.84	0.67	0.66	0.68	0.75	0.71	0.65	0.65	0.68	0.70
18	1.00	0.99	0.99	0.98	0.97	0.98	0.99	0.88	0.67	0.66	0.68	0.75	0.71	0.65	0.65	0.68	0.70
24	1.00	0.99	0.98	0.96	0.95	0.96	0.96	0.91	0.80	0.71	0.62	0.52	0.58	0.65	0.65	0.68	0.70
30	1.00	0.99	0.98	0.96	0.95	0.92	0.89	0.84	0.74	0.73	0.70	0.66	0.66	0.65	0.65	0.68	0.70
40	1.00	0.99	0.98	0.96	0.95	0.91	0.86	0.86	0.86	0.72	0.67	0.70	0.68	0.65	0.65	0.68	0.70
60	1.00	0.99	0.98	0.96	0.95	0.91	0.86	0.86	0.86	0.73	0.71	0.78	0.78	0.70	0.57	0.64	0.70
77	1.00	0.99	0.98	0.96	0.95	0.91	0.86	0.86	0.86	0.73	0.71	0.78	0.78	0.70	0.57	0.64	0.70

Unique Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
6	-1	-1	-1	-1	-1	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
8	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
10	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
18	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
24	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
30	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
40	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
60	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
77	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

Unique Supporting table - 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	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1
16	1	1	1	0	1	1	1	1	1
20	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0
30	0	0	-1	0	0	0	0	0	0
40	0	0	-1	-1	0	0	0	0	0
60	-1	0	-1	-1	0	0	0	0	0
98	-1	0	-1	-1	0	0	0	0	0

Unique Supporting table - 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	2.00	2.00	2.00	2.04	2.25	2.70	3.00	3.00	3.00
12	2.00	2.00	2.00	2.04	2.25	2.70	3.00	3.00	3.00
16	1.66	1.66	1.49	1.48	1.50	1.72	1.80	1.97	1.97
20	0.95	0.95	0.79	0.76	0.79	0.92	0.95	1.09	1.14
24	0.50	0.49	0.45	0.38	0.48	0.58	0.62	0.71	0.78
30	0.38	0.31	0.31	0.32	0.40	0.45	0.48	0.54	0.59
40	0.32	0.18	0.22	0.32	0.40	0.43	0.46	0.48	0.53
60	0.25	0.13	0.20	0.32	0.40	0.43	0.45	0.47	0.52
98	0.24	0.12	0.20	0.32	0.40	0.43	0.45	0.47	0.52

Unique Supporting table - CylModeDecel

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

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

CylModeDecel - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	6,108	6,008	3,000	1,577	1,400	677	725	375	400	300	180	119	80
6	6,235	6,135	3,000	1,306	1,366	617	725	470	400	300	180	91	73
8	6,346	6,246	3,046	1,221	1,173	643	737	512	400	254	143	95	69
10	6,458	6,358	3,100	1,365	953	615	693	379	288	229	103	86	77
12	6,569	6,469	3,169	1,601	1,066	726	581	435	265	199	116	87	70
14	6,681	6,581	3,362	1,826	1,327	869	631	467	350	211	137	99	75
16	6,792	6,692	3,584	2,080	1,505	1,011	705	542	381	220	158	107	88
18	6,904	6,804	3,618	2,307	1,684	1,154	904	665	453	301	188	121	96
20	7,073	6,916	4,116	2,523	1,863	1,362	1,016	808	539	332	223	150	112
22	7,649	7,027	4,412	2,677	2,042	1,458	1,127	870	627	416	299	188	130
24	8,225	7,119	5,000	2,835	2,220	1,588	1,186	932	674	469	334	201	144
26	8,702	7,175	5,000	3,083	2,449	1,726	1,158	951	713	512	360	204	154
30	9,327	7,789	5,173	3,597	2,757	2,012	1,355	1,058	837	591	408	229	177
40	9,976	9,976	6,653	4,472	3,650	2,726	1,848	1,428	1,234	863	555	367	270
60	9,976	9,976	9,976	6,517	5,438	4,155	2,834	2,167	1,777	1,131	838	556	431
78	9,976	9,976	9,976	8,307	7,002	5,406	3,727	2,842	2,332	1,485	991	625	476
97	11,751	10,683	9,976	9,976	8,460	6,571	4,700	3,600	2,850	1,815	1,212	764	583

CylModeDecel - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
3	80	80	50	45	38	24	16	12	10	10	10	7	9
6	80	82	52	45	34	22	14	12	10	10	8	6	7
8	80	81	52	41	32	15	14	10	9	9	8	6	6
10	57	50	35	27	28	12	14	8	8	8	7	6	6
12	47	36	29	23	21	13	11	8	7	7	7	7	7
14	56	42	36	27	24	14	11	9	7	6	7	6	6
16	62	50	38	30	24	15	11	11	7	6	6	6	6
18	73	53	42	35	27	16	13	10	8	6	6	6	6
20	86	65	50	42	32	19	15	10	8	6	6	5	5
22	99	79	60	48	38	21	16	12	9	7	6	6	6
24	113	90	68	53	42	23	17	12	10	8	7	6	6
26	125	99	76	60	47	26	18	13	10	8	7	6	6
30	142	111	85	68	56	32	21	15	12	9	8	6	7

Unique Supporting table - CylModeDecel

40	199	148	116	93	73	44	29	20	15	12	10	8	9
60	319	251	194	157	130	77	45	29	24	18	14	11	17
78	398	307	238	208	186	125	58	36	30	24	19	16	33
97	439	342	280	250	220	150	100	44	36	30	23	18	39

Unique Supporting table - CylModeJerk

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

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

CylModeJerk - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	5,708	5,608	2,486	1,673	1,500	695	750	400	400	300	150	125	80
6	5,835	5,735	2,435	1,315	1,431	568	750	495	400	300	185	120	74
8	5,946	5,846	2,546	1,284	1,173	643	750	675	400	254	197	129	84
10	6,058	5,958	2,600	1,365	968	694	693	675	277	229	112	113	100
12	6,169	6,069	3,118	1,547	1,142	857	599	675	262	188	199	85	73
14	6,281	6,181	3,514	1,755	1,326	1,020	636	467	350	208	152	87	68
16	6,392	6,292	3,579	1,979	1,504	1,183	742	541	397	306	146	99	77
18	6,504	6,404	3,746	2,220	1,685	1,347	841	615	415	284	172	113	87
20	7,073	6,516	4,058	2,516	1,865	1,510	1,008	762	445	287	209	137	102
22	7,649	6,627	4,853	2,666	2,038	1,673	1,090	835	519	360	261	165	117
24	8,225	7,082	5,000	2,936	2,217	1,836	1,195	879	552	395	292	187	138
26	8,702	7,585	5,057	3,187	2,395	2,049	1,231	935	606	426	310	199	152
30	9,327	8,374	5,617	3,597	2,751	2,326	1,439	1,107	729	497	361	227	177
40	9,976	9,976	7,176	4,472	3,642	3,143	1,959	1,428	1,101	725	505	356	254
60	9,976	9,976	9,945	6,517	5,424	4,776	2,998	2,167	1,522	917	807	603	432
78	9,976	9,976	9,976	8,307	6,983	6,123	3,908	2,814	1,994	1,231	935	652	449
97	11,751	10,683	9,976	9,976	8,436	7,000	4,755	3,417	2,434	1,650	1,144	799	550

CylModeJerk - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
3	80	80	50	45	30	21	14	13	10	10	8	7	7
6	77	82	52	45	30	18	14	13	10	10	8	6	7
8	61	81	48	41	28	15	14	10	9	9	8	6	7
10	45	51	32	25	20	12	14	7	6	8	7	6	7
12	42	35	27	21	17	12	9	6	5	7	7	7	7
14	49	39	31	25	20	12	8	7	6	5	7	6	6
16	57	45	34	25	21	13	9	9	7	4	6	4	4
18	67	51	38	29	23	14	10	9	7	5	4	4	5
20	76	58	43	36	29	18	12	9	8	5	5	4	5
22	89	71	53	43	36	23	15	9	8	6	5	5	5
24	102	80	61	47	40	25	16	10	9	7	5	5	5
26	113	88	70	54	46	27	15	11	10	7	5	5	6
30	128	98	82	64	55	33	19	13	11	7	5	6	8

Unique Supporting table - CylModeJerk

40	183	140	107	85	70	44	26	19	14	12	8	7	11
60	313	233	175	135	115	66	42	28	22	19	16	11	18
78	363	252	214	165	138	83	52	34	25	27	24	15	24
97	446	308	234	191	147	95	55	41	30	33	29	17	29

Unique Supporting table - DeacCylInversionDecel

Description: Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong" If deactivated cylinders don't decelerate at least this amount then the crank signal is inverting. Function of speed and load.

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

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	75	75	38	5	3	4	2	2	2
12	75	75	38	5	3	4	2	2	2
16	125	125	40	10	3	4	2	2	2
20	125	125	63	11	3	4	2	2	2
24	150	150	75	20	10	4	2	2	2
30	275	275	138	38	20	13	8	5	5
40	300	300	138	50	30	15	10	7	7
60	400	400	150	70	35	18	11	8	8
98	400	400	200	95	50	25	20	15	15

Unique Supporting table - DeacCylInversionJerk

Description: Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong" If deactivated cylinders don't jerk at least this amount then the crank signal is inverting. Function of speed and load.

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

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	100	100	50	25	10	10	8	5	5
12	100	100	50	25	10	10	8	5	5
16	200	200	100	38	10	10	8	5	5
20	250	250	150	63	18	10	8	5	5
24	350	350	210	75	40	13	8	6	6
30	650	650	400	150	75	30	25	20	20
40	750	750	425	163	80	33	25	20	20
60	1,125	1,125	500	200	100	50	33	22	22
98	1,125	1,125	650	273	138	80	50	33	33

Unique Supporting table - EngineOverSpeedLimit

Description: Engine OverSpeed Limit versus gear

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

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	7,200	7,200	7,200	7,200	7,200	7,200	7,200

EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	7,200	4,000	4,000	4,000	7,200	7,200	

Unique Supporting table - 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	6,108	6,008	3,000	1,577	1,400	677	725	375	400	300	180	119	80
6	6,235	6,135	3,000	1,306	1,366	617	725	470	400	300	180	91	73
8	6,346	6,246	3,046	1,221	1,173	643	737	512	400	254	143	95	69
10	6,458	6,358	3,100	1,365	953	615	693	379	288	229	103	86	77
12	6,569	6,469	3,169	1,601	1,066	726	581	435	265	199	116	87	70
14	6,681	6,581	3,362	1,826	1,327	869	631	467	350	211	137	99	75
16	6,792	6,692	3,584	2,080	1,505	1,011	705	542	381	220	158	107	88
18	6,904	6,804	3,618	2,307	1,684	1,154	904	665	453	301	188	121	96
20	7,073	6,916	4,116	2,523	1,863	1,362	1,016	808	539	332	223	150	112
22	7,649	7,027	4,412	2,677	2,042	1,458	1,127	870	627	416	299	188	130
24	8,225	7,119	5,000	2,835	2,220	1,588	1,186	932	674	469	334	201	144
26	8,702	7,175	5,000	3,083	2,449	1,726	1,158	951	713	512	360	204	154
30	9,327	7,789	5,173	3,597	2,757	2,012	1,355	1,058	837	591	408	229	177
40	9,976	9,976	6,653	4,472	3,650	2,726	1,848	1,428	1,234	863	555	367	270
60	9,976	9,976	9,976	6,517	5,438	4,155	2,834	2,167	1,777	1,131	838	556	431
78	9,976	9,976	9,976	8,307	7,002	5,406	3,727	2,842	2,332	1,485	991	625	476
97	11,751	10,683	9,976	9,976	8,460	6,571	4,700	3,600	2,850	1,815	1,212	764	583

Unique Supporting table - 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	5,708	5,608	2,486	1,673	1,500	695	750	400	400	300	150	125	80
6	5,835	5,735	2,435	1,315	1,431	568	750	495	400	300	185	120	74
8	5,946	5,846	2,546	1,284	1,173	643	750	675	400	254	197	129	84
10	6,058	5,958	2,600	1,365	968	694	693	675	277	229	112	113	100
12	6,169	6,069	3,118	1,547	1,142	857	599	675	262	188	199	85	73
14	6,281	6,181	3,514	1,755	1,326	1,020	636	467	350	208	152	87	68
16	6,392	6,292	3,579	1,979	1,504	1,183	742	541	397	306	146	99	77
18	6,504	6,404	3,746	2,220	1,685	1,347	841	615	415	284	172	113	87
20	7,073	6,516	4,058	2,516	1,865	1,510	1,008	762	445	287	209	137	102
22	7,649	6,627	4,853	2,666	2,038	1,673	1,090	835	519	360	261	165	117
24	8,225	7,082	5,000	2,936	2,217	1,836	1,195	879	552	395	292	187	138
26	8,702	7,585	5,057	3,187	2,395	2,049	1,231	935	606	426	310	199	152
30	9,327	8,374	5,617	3,597	2,751	2,326	1,439	1,107	729	497	361	227	177
40	9,976	9,976	7,176	4,472	3,642	3,143	1,959	1,428	1,101	725	505	356	254
60	9,976	9,976	9,945	6,517	5,424	4,776	2,998	2,167	1,522	917	807	603	432
78	9,976	9,976	9,976	8,307	6,983	6,123	3,908	2,814	1,994	1,231	935	652	449
97	11,751	10,683	9,976	9,976	8,436	7,000	4,755	3,417	2,434	1,650	1,144	799	550

Unique Supporting table - 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	5,423	5,328	2,362	1,589	1,425	660	713	380	380	285	143	119	76
6	5,543	5,448	2,313	1,249	1,360	540	713	470	380	285	176	114	70
8	5,649	5,554	2,419	1,220	1,115	611	713	642	380	241	187	122	80
10	5,755	5,660	2,470	1,297	919	659	658	642	263	218	107	107	95
12	5,861	5,766	2,962	1,470	1,085	814	569	642	249	179	189	80	69
14	5,967	5,872	3,338	1,668	1,260	969	604	444	332	198	145	83	65
16	6,073	5,978	3,400	1,880	1,429	1,124	705	514	377	291	139	94	73
18	6,179	6,084	3,559	2,109	1,601	1,279	799	584	394	270	163	107	82
20	6,720	6,190	3,856	2,390	1,772	1,435	958	724	423	273	199	130	97
22	7,266	6,295	4,611	2,533	1,936	1,589	1,035	793	493	342	248	157	111
24	7,813	6,728	4,750	2,789	2,106	1,745	1,136	835	525	375	277	178	131
26	8,267	7,206	4,804	3,028	2,275	1,947	1,170	888	576	404	294	189	144
30	8,861	7,956	5,336	3,417	2,614	2,210	1,367	1,052	692	472	343	216	168
40	9,477	9,477	6,817	4,248	3,460	2,986	1,861	1,357	1,046	689	480	339	242
60	9,477	9,477	9,448	6,191	5,153	4,537	2,848	2,059	1,446	872	766	573	410
78	9,477	9,477	9,477	7,892	6,634	5,817	3,712	2,673	1,895	1,170	888	619	427
97	11,164	10,149	9,477	9,477	8,014	6,650	4,518	3,246	2,312	1,568	1,087	759	523

Unique Supporting table - 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	5,803	5,708	2,850	1,498	1,330	643	689	357	380	285	171	114	76
6	5,923	5,828	2,850	1,241	1,297	587	689	447	380	285	171	86	70
8	6,029	5,934	2,894	1,160	1,115	611	700	486	380	241	136	90	66
10	6,135	6,040	2,945	1,297	906	584	658	360	274	218	98	82	74
12	6,241	6,146	3,011	1,521	1,013	689	552	413	252	189	110	83	66
14	6,347	6,252	3,194	1,735	1,260	825	599	444	332	200	130	94	71
16	6,453	6,358	3,405	1,976	1,430	961	670	515	362	209	150	101	84
18	6,559	6,464	3,437	2,192	1,600	1,097	859	632	430	286	179	115	91
20	6,720	6,570	3,910	2,397	1,770	1,294	965	768	512	315	212	142	106
22	7,266	6,675	4,191	2,543	1,939	1,385	1,070	827	596	396	284	179	123
24	7,813	6,763	4,750	2,694	2,109	1,509	1,127	885	640	445	317	191	137
26	8,267	6,816	4,750	2,929	2,327	1,640	1,100	904	677	487	342	194	146
30	8,861	7,400	4,914	3,417	2,619	1,911	1,287	1,005	796	562	387	218	168
40	9,477	9,477	6,321	4,248	3,468	2,590	1,755	1,357	1,172	820	527	349	257
60	9,477	9,477	9,477	6,191	5,166	3,948	2,692	2,059	1,688	1,075	796	528	409
78	9,477	9,477	9,477	7,892	6,652	5,135	3,540	2,700	2,216	1,411	942	594	453
97	11,164	10,149	9,477	9,477	8,037	6,243	4,465	3,420	2,707	1,725	1,151	726	554

Unique 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	60.0	60.0	40.0	10.0	10.0	10.0	20.0	40.0	60.0

Unique 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	-20	-10	0	8	16	20	24	32	40	48	64	80	90	112
0	15.0	15.0	15.0	12.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
13	15.0	15.0	15.0	12.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
25	15.0	15.0	15.0	14.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
38	15.0	15.0	15.0	14.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
50	16.0	16.0	16.0	15.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
63	16.0	16.0	16.0	15.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	4.0
75	16.0	16.0	16.0	16.0	8.0	8.0	8.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	4.0
88	16.0	16.0	16.0	16.0	8.0	8.0	8.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	4.0
100	16.0	16.0	16.0	16.0	8.0	8.0	8.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	4.0

Unique 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	-20	-10	0	8	16	20	24	32	40	48	64	80	90	112
1	10.0	10.0	10.0	9.0	7.0	5.0	4.0	3.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Unique 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	-20	-10	0	8	16	20	24	32	40	48	64	80	90	112
0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
13	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
38	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
63	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
75	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
88	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
100	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Unique 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	20	20	20	20	20
0.125	20	20	20	20	20
0.250	20	20	20	20	20
0.375	20	20	20	20	20
0.500	19	19	19	19	19
0.625	19	19	19	19	19
0.750	19	19	19	19	19
0.875	19	19	19	19	19
1.000	19	19	19	19	19

Unique 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	25.0	50.0	75.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Unique 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	1	2	4	7	10	15	20	30
1	0	0	1	1	1	1	1	1	1

Unique 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	1	2	4	7	10	15	20	30

Unique 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	100	300	500	700	800	850	880	925	980	1,025	1,050	1,100	1,300	1,500	1,800	2,000	2,200
1	2	4	5	5	5	5	6	9	11	12	12	12	12	12	12	12	18

Unique 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	-20	-16	-12	-8	-4	0	4	8	12
1	1.38	1.38	1.31	1.19	1.00	0.88	0.81	0.69	0.63

Unique 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	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
40	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
80	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
120	9,999.00	18.25	18.25	6.00	15.75	9.00	13.00	6.25	7.25	4.25	1.25	1.25	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
160	9,999.00	18.25	18.25	6.00	15.75	9.00	13.00	6.25	7.25	9.50	1.25	1.75	2.25	9,999.00	9,999.00	9,999.00	9,999.00
200	9,999.00	75.25	75.25	38.00	49.50	31.75	47.00	33.00	61.25	19.75	8.75	2.25	2.25	9,999.00	9,999.00	9,999.00	9,999.00
240	9,999.00	103.00	103.00	84.25	81.50	72.00	71.00	111.50	104.75	33.50	31.50	6.00	6.00	9,999.00	9,999.00	9,999.00	9,999.00
280	9,999.00	160.50	160.50	133.50	112.75	94.75	75.00	137.50	117.25	69.50	38.25	20.00	20.00	9,999.00	9,999.00	9,999.00	9,999.00
320	9,999.00	143.25	143.25	136.50	138.25	137.00	123.50	111.00	136.75	87.50	69.50	52.50	52.50	9,999.00	9,999.00	9,999.00	9,999.00
360	9,999.00	177.50	177.50	174.00	143.25	156.50	112.25	109.75	133.25	63.00	71.50	58.00	58.00	9,999.00	9,999.00	9,999.00	9,999.00
400	9,999.00	173.75	173.75	159.75	131.50	155.75	152.50	134.00	133.25	112.25	95.00	74.25	74.25	9,999.00	9,999.00	9,999.00	9,999.00
440	9,999.00	190.50	190.50	138.75	129.25	125.25	142.50	139.00	155.25	123.50	107.00	93.00	93.00	9,999.00	9,999.00	9,999.00	9,999.00
480	9,999.00	190.50	190.50	138.75	129.25	125.25	142.50	139.00	155.25	123.50	107.00	93.00	93.00	9,999.00	9,999.00	9,999.00	9,999.00
520	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
560	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
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
640	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
680	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

Unique 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	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96	0.96	1.00	1.00	0.00	0.00	0.00	0.00
240	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
280	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
320	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
360	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
400	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
440	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
480	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
520	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
560	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
640	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
680	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

Unique 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	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
40	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
80	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
120	9,999.00	63.50	63.50	32.00	23.75	16.50	20.00	20.25	19.00	17.75	16.75	16.75	9,999.00	9,999.00	9,999.00	9,999.00	9,999.00
160	9,999.00	63.50	63.50	32.00	23.75	16.50	20.00	20.25	19.00	18.50	16.75	15.50	14.00	9,999.00	9,999.00	9,999.00	9,999.00
200	9,999.00	64.00	64.00	49.25	31.75	35.00	26.25	61.00	50.75	19.75	19.00	14.00	14.00	9,999.00	9,999.00	9,999.00	9,999.00
240	9,999.00	57.25	57.25	46.50	41.75	31.25	33.50	47.50	58.25	31.25	27.50	21.00	21.00	9,999.00	9,999.00	9,999.00	9,999.00
280	9,999.00	63.00	63.00	63.00	58.25	41.50	49.50	56.00	76.50	44.00	28.00	19.50	19.50	9,999.00	9,999.00	9,999.00	9,999.00
320	9,999.00	71.00	71.00	87.50	43.00	57.50	55.25	66.25	59.00	37.50	32.25	27.50	27.50	9,999.00	9,999.00	9,999.00	9,999.00
360	9,999.00	67.00	67.00	59.50	56.50	45.50	56.00	76.00	48.50	36.25	30.00	33.75	33.75	9,999.00	9,999.00	9,999.00	9,999.00
400	9,999.00	80.50	80.50	58.75	54.75	36.75	44.50	54.50	61.75	42.25	31.50	38.25	38.25	9,999.00	9,999.00	9,999.00	9,999.00
440	9,999.00	74.00	74.00	87.25	61.50	49.25	41.50	53.25	46.75	35.25	36.00	34.50	34.50	9,999.00	9,999.00	9,999.00	9,999.00
480	9,999.00	74.00	74.00	87.25	61.50	49.25	41.50	53.25	46.75	35.25	36.00	34.50	34.50	9,999.00	9,999.00	9,999.00	9,999.00
520	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
560	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
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
640	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
680	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

Unique 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	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
40	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
80	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
120	9,999.00	45.50	45.50	3.00	10.50	13.00	19.75	2.25	6.50	6.50	3.25	3.25	3.25	9,999.00	9,999.00	9,999.00	9,999.00
160	9,999.00	45.50	45.50	3.00	10.50	13.00	19.75	2.25	6.50	17.50	8.50	3.25	3.25	9,999.00	9,999.00	9,999.00	9,999.00
200	9,999.00	115.75	115.75	16.00	41.50	48.00	51.25	63.50	45.50	28.25	13.50	4.50	4.50	9,999.00	9,999.00	9,999.00	9,999.00
240	9,999.00	167.00	167.00	114.50	127.50	112.75	80.75	98.50	115.50	41.75	52.50	16.00	16.00	9,999.00	9,999.00	9,999.00	9,999.00
280	9,999.00	196.50	196.50	121.75	133.75	119.75	78.50	129.00	145.25	77.00	51.25	29.50	29.50	9,999.00	9,999.00	9,999.00	9,999.00
320	9,999.00	164.00	164.00	204.25	190.00	170.25	141.00	129.50	141.00	113.50	85.00	72.25	72.25	9,999.00	9,999.00	9,999.00	9,999.00
360	9,999.00	203.00	203.00	209.25	205.25	169.50	136.00	140.00	145.75	71.00	82.00	89.00	89.00	9,999.00	9,999.00	9,999.00	9,999.00
400	9,999.00	229.00	229.00	228.25	201.50	189.75	151.00	151.00	162.75	122.25	107.25	96.50	96.50	9,999.00	9,999.00	9,999.00	9,999.00
440	9,999.00	244.25	244.25	245.75	207.25	170.00	152.25	143.25	175.75	123.25	119.75	103.50	103.50	9,999.00	9,999.00	9,999.00	9,999.00
480	9,999.00	244.25	244.25	245.75	207.25	170.00	152.25	143.25	175.75	123.25	119.75	103.50	103.50	9,999.00	9,999.00	9,999.00	9,999.00
520	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
560	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
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
640	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
680	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

Unique 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	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96	0.96	1.00	1.00	0.00	0.00	0.00	0.00
240	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
280	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
320	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
360	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
400	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
440	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
480	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
520	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
560	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
640	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
680	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

Unique 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	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
40	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
80	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
120	9,999.00	25.00	25.00	28.00	17.25	15.00	17.00	21.25	16.50	16.50	12.75	12.75	12.75	9,999.00	9,999.00	9,999.00	9,999.00
160	9,999.00	25.00	25.00	28.00	17.25	15.00	17.00	21.25	16.50	14.25	14.00	12.75	12.75	9,999.00	9,999.00	9,999.00	9,999.00
200	9,999.00	54.00	54.00	80.75	52.75	33.25	28.50	34.00	25.00	12.00	15.25	20.00	20.00	9,999.00	9,999.00	9,999.00	9,999.00
240	9,999.00	39.50	39.50	41.50	41.75	28.50	45.00	41.00	33.50	20.50	22.25	18.75	18.75	9,999.00	9,999.00	9,999.00	9,999.00
280	9,999.00	53.50	53.50	70.00	59.50	43.75	51.75	27.50	26.00	24.00	27.75	24.25	24.25	9,999.00	9,999.00	9,999.00	9,999.00
320	9,999.00	76.50	76.50	31.50	47.50	48.50	34.25	39.75	40.25	18.50	23.00	22.50	22.50	9,999.00	9,999.00	9,999.00	9,999.00
360	9,999.00	55.75	55.75	47.25	50.50	57.50	44.00	45.50	30.50	32.75	33.50	33.50	33.50	9,999.00	9,999.00	9,999.00	9,999.00
400	9,999.00	68.75	68.75	39.75	43.75	38.00	35.00	42.00	41.00	25.25	28.25	23.25	23.25	9,999.00	9,999.00	9,999.00	9,999.00
440	9,999.00	60.00	60.00	47.50	45.50	43.00	34.00	46.00	39.50	41.25	31.75	28.50	28.50	9,999.00	9,999.00	9,999.00	9,999.00
480	9,999.00	60.00	60.00	47.50	45.50	43.00	34.00	46.00	39.50	41.25	31.75	28.50	28.50	9,999.00	9,999.00	9,999.00	9,999.00
520	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
560	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
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
640	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
680	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

Unique Sup. table - P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)

Description: KtFWDD_Cnt_SampleWeigthting: Calibration table that defines the weighting factor used in a sample of the measured transfer case ratio for full range diagnostics, based on vehicle speed and axle torque.

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: KtFWDD_Cnt_SampleWeigthting

y/x	0.00	3.00	5.00	5.10	12.00	15.00	18.00	21.00	24.00
-200.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001
-150.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001
-100.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001
-50.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001
0.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001
50.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001
100.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001
150.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001
200.00	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001	0.1001

Unique Supporting table - P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)

Description: LeFWDD_r_RatioHiBound_P279A = KeFWDD_r_TCaseHiRange + KtFWDD_r_TCaseHiRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound_P279A

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
2.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
3.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
4.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
5.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
6.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
7.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
8.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
9.00	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000

Unique Supporting table - P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)

Description: LeFWDD_r_RatioLoBound_P279A = KeFWDD_r_TCaseHiRange - KtFWDD_r_TCaseHiRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound_P279A

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
2.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
3.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
4.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
5.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
6.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
7.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
8.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
9.00	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000

Unique Supporting table - P279B Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)

Description: LeFWDD_r_RatioHiBound_P279B = KeFWDD_r_TCaseLoRange + KtFWDD_r_TCaseLoRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound_P279B

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099
2.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099
3.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099
4.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099
5.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099
6.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099
7.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099
8.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099
9.00	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099	2.8099

Unique Supporting table - P279B Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)

Description: LeFWDD_r_RatioLoBound_P279B = KeFWDD_r_TCaseLoRange - KtFWDD_r_TCaseLoRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound_P279B

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100
2.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100
3.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100
4.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100
5.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100
6.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100
7.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100
8.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100
9.00	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100	2.6100

Unique Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 1)

Description: LeFWDD_r_RatioHiBound1_P279C = KeFWDD_r_TCaseHiRange + KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound1_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	8.9999	8.9999	8.9999	2.0000	1.1000	1.1000	1.1000	1.1000	1.1000
2.00	8.9999	8.9999	8.9999	2.0000	2.0000	2.0000	1.5000	1.5000	1.5000
3.00	8.9999	8.9999	8.9999	3.0000	3.0000	3.0000	2.0000	2.0000	2.0000
4.00	8.9999	8.9999	8.9999	5.0000	5.0000	5.0000	3.0000	3.0000	3.0000
5.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
6.00	8.9999	8.9999	8.9999	5.0000	5.0000	5.0000	3.0000	3.0000	3.0000
7.00	8.9999	8.9999	8.9999	3.0000	3.0000	3.0000	2.0000	2.0000	2.0000
8.00	8.9999	8.9999	8.9999	2.0000	2.0000	2.0000	1.5000	1.5000	1.5000
9.00	8.9999	8.9999	8.9999	2.0000	1.1000	1.1000	1.1000	1.1000	1.1000

Unique Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 2)

Description: LeFWDD_r_RatioHiBound2_P279C = KeFWDD_r_TCaseLoRange + KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound2_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	10.7098	10.7098	10.7098	3.7100	2.8099	2.8099	2.8099	2.8099	2.8099
2.00	10.7098	10.7098	10.7098	3.7100	3.7100	3.7100	3.2100	3.2100	3.2100
3.00	10.7098	10.7098	10.7098	4.7100	4.7100	4.7100	3.7100	3.7100	3.7100
4.00	10.7098	10.7098	10.7098	6.7100	6.7100	6.7100	4.7100	4.7100	4.7100
5.00	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098
6.00	10.7098	10.7098	10.7098	6.7100	6.7100	6.7100	4.7100	4.7100	4.7100
7.00	10.7098	10.7098	10.7098	4.7100	4.7100	4.7100	3.7100	3.7100	3.7100
8.00	10.7098	10.7098	10.7098	3.7100	3.7100	3.7100	3.2100	3.2100	3.2100
9.00	10.7098	10.7098	10.7098	3.7100	2.8099	2.8099	2.8099	2.8099	2.8099

Unique Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 1)

Description: LeFWDD_r_RatioLoBound1_P279C = KeFWDD_r_TCaseHiRange - KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound1_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-6.9999	-6.9999	-6.9999	0.0000	0.9000	0.9000	0.9000	0.9000	0.9000
2.00	-6.9999	-6.9999	-6.9999	0.0000	0.0000	0.0000	0.5000	0.5000	0.5000
3.00	-6.9999	-6.9999	-6.9999	-1.0000	-1.0000	-1.0000	0.0000	0.0000	0.0000
4.00	-6.9999	-6.9999	-6.9999	-3.0000	-3.0000	-3.0000	-1.0000	-1.0000	-1.0000
5.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
6.00	-6.9999	-6.9999	-6.9999	-3.0000	-3.0000	-3.0000	-1.0000	-1.0000	-1.0000
7.00	-6.9999	-6.9999	-6.9999	-1.0000	-1.0000	-1.0000	0.0000	0.0000	0.0000
8.00	-6.9999	-6.9999	-6.9999	0.0000	0.0000	0.0000	0.5000	0.5000	0.5000
9.00	-6.9999	-6.9999	-6.9999	0.0000	0.9000	0.9000	0.9000	0.9000	0.9000

Unique Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 2)

Description: LeFWDD_r_RatioLoBound2_P279C = KeFWDD_r_TCaseLoRange - KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound2_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-5.2899	-5.2899	-5.2899	1.7100	2.6100	2.6100	2.6100	2.6100	2.6100
2.00	-5.2899	-5.2899	-5.2899	1.7100	1.7100	1.7100	2.2100	2.2100	2.2100
3.00	-5.2899	-5.2899	-5.2899	0.7100	0.7100	0.7100	1.7100	1.7100	1.7100
4.00	-5.2899	-5.2899	-5.2899	-1.2900	-1.2900	-1.2900	0.7100	0.7100	0.7100
5.00	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899
6.00	-5.2899	-5.2899	-5.2899	-1.2900	-1.2900	-1.2900	0.7100	0.7100	0.7100
7.00	-5.2899	-5.2899	-5.2899	0.7100	0.7100	0.7100	1.7100	1.7100	1.7100
8.00	-5.2899	-5.2899	-5.2899	1.7100	1.7100	1.7100	2.2100	2.2100	2.2100
9.00	-5.2899	-5.2899	-5.2899	1.7100	2.6100	2.6100	2.6100	2.6100	2.6100

Unique Supporting table - 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	1,000	1,200	1,600	2,000
6	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
8	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
10	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
18	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
24	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
30	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
40	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
60	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
77	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

Unique Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
6	0.90	0.90	0.90	0.90	0.90	0.88	0.85	0.90	1.00	1.00	0.93	0.80	0.89	0.97	0.90	0.93	0.95
8	0.71	0.75	0.79	0.84	0.88	0.84	0.80	0.87	1.00	0.95	0.91	0.88	0.93	0.95	0.85	0.90	0.95
10	0.71	0.74	0.77	0.79	0.82	0.81	0.81	0.85	0.92	0.92	0.91	0.90	0.93	0.91	0.80	0.88	0.95
18	0.89	0.89	0.89	0.89	0.89	0.84	0.79	0.78	0.75	0.88	0.95	0.96	0.98	0.90	0.70	0.70	0.70
24	0.86	0.86	0.87	0.88	0.88	0.87	0.85	0.82	0.75	0.88	0.91	0.82	0.90	0.90	0.70	0.70	0.70
30	0.90	0.86	0.83	0.79	0.75	0.85	0.96	0.89	0.74	0.77	0.80	0.83	0.91	0.87	0.60	0.67	0.73
40	0.93	0.90	0.87	0.83	0.80	0.83	0.86	0.78	0.63	0.66	0.71	0.78	0.87	0.89	0.70	0.73	0.75
60	0.95	0.92	0.89	0.86	0.83	0.87	0.90	0.83	0.70	0.73	0.76	0.78	0.86	0.91	0.80	0.80	0.80
77	1.00	0.96	0.92	0.89	0.85	0.89	0.92	0.86	0.75	0.78	0.82	0.85	0.92	0.93	0.80	0.80	0.80

Unique Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
6	0.75	0.81	0.88	0.94	1.00	1.05	1.10	1.17	1.30	1.30	1.28	1.25	1.25	1.17	1.00	1.00	1.00
8	0.75	0.81	0.88	0.94	1.00	1.05	1.10	1.17	1.30	1.30	1.28	1.25	1.25	1.17	1.00	1.00	1.00
10	0.80	0.85	0.90	0.95	1.00	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.22	1.17	1.00	1.00	1.00
18	0.85	0.89	0.92	0.96	1.00	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.22	1.17	1.00	1.00	1.00
24	0.90	0.92	0.95	0.98	1.00	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.22	1.13	0.90	0.95	1.00
30	1.00	1.00	1.00	1.00	1.00	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.22	1.17	1.00	0.95	0.90
40	1.10	1.08	1.05	1.02	1.00	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.22	1.20	1.10	1.10	1.10
60	1.10	1.08	1.05	1.02	1.00	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.22	1.20	1.10	1.10	1.10
77	1.10	1.08	1.05	1.02	1.00	1.10	1.20	1.23	1.28	1.29	1.30	1.30	1.30	1.27	1.20	1.20	1.20

Unique Supporting table - 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	1,000	1,200	1,600	2,000
6	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
8	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
18	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
24	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
30	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
40	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
60	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
77	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10

Unique Supporting table - 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	1,000	1,200	1,600	2,000
6	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
8	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
18	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
24	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
30	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
40	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
60	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
77	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10

Unique Supporting table - 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	600	700	800	900	1,000	1,100	1,200	1,400	1,800	2,200	2,600	3,000	4,000	5,000	6,000	7,000
6	1.00	1.01	1.02	1.04	1.05	1.08	1.10	1.07	1.00	1.00	1.03	1.10	1.14	1.20	1.20	1.20	1.20
8	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.17	1.10	1.17	1.20	1.20	1.20	1.20	1.20	1.20	1.20
10	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.27	1.30	1.30	1.26	1.20	1.20	1.20	1.20
18	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.27	1.30	1.30	1.34	1.33	1.20	1.20	1.20
24	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.27	1.30	1.30	1.34	1.33	1.20	1.20	1.20
30	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.29	1.33	1.20	1.20	1.20
40	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.29	1.33	1.20	1.20	1.20
60	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.29	1.33	1.20	1.10	1.00
77	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.29	1.33	1.20	1.20	1.20

Unique Supporting table - Ring Filter

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

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

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

Unique Supporting table - 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	5,423	5,328	2,362	1,589	1,425	660	713	380	380	285	143	119	76
6	5,543	5,448	2,313	1,249	1,360	540	713	470	380	285	176	114	70
8	5,649	5,554	2,419	1,220	1,115	611	713	642	380	241	187	122	80
10	5,755	5,660	2,470	1,297	919	659	658	642	263	218	107	107	95
12	5,861	5,766	2,962	1,470	1,085	814	569	642	249	179	189	80	69
14	5,967	5,872	3,338	1,668	1,260	969	604	444	332	198	145	83	65
16	6,073	5,978	3,400	1,880	1,429	1,124	705	514	377	291	139	94	73
18	6,179	6,084	3,559	2,109	1,601	1,279	799	584	394	270	163	107	82
20	6,720	6,190	3,856	2,390	1,772	1,435	958	724	423	273	199	130	97
22	7,266	6,295	4,611	2,533	1,936	1,589	1,035	793	493	342	248	157	111
24	7,813	6,728	4,750	2,789	2,106	1,745	1,136	835	525	375	277	178	131
26	8,267	7,206	4,804	3,028	2,275	1,947	1,170	888	576	404	294	189	144
30	8,861	7,956	5,336	3,417	2,614	2,210	1,367	1,052	692	472	343	216	168
40	9,477	9,477	6,817	4,248	3,460	2,986	1,861	1,357	1,046	689	480	339	242
60	9,477	9,477	9,448	6,191	5,153	4,537	2,848	2,059	1,446	872	766	573	410
78	9,477	9,477	9,477	7,892	6,634	5,817	3,712	2,673	1,895	1,170	888	619	427
97	11,164	10,149	9,477	9,477	8,014	6,650	4,518	3,246	2,312	1,568	1,087	759	523

Unique Supporting table - 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	5,803	5,708	2,850	1,498	1,330	643	689	357	380	285	171	114	76
6	5,923	5,828	2,850	1,241	1,297	587	689	447	380	285	171	86	70
8	6,029	5,934	2,894	1,160	1,115	611	700	486	380	241	136	90	66
10	6,135	6,040	2,945	1,297	906	584	658	360	274	218	98	82	74
12	6,241	6,146	3,011	1,521	1,013	689	552	413	252	189	110	83	66
14	6,347	6,252	3,194	1,735	1,260	825	599	444	332	200	130	94	71
16	6,453	6,358	3,405	1,976	1,430	961	670	515	362	209	150	101	84
18	6,559	6,464	3,437	2,192	1,600	1,097	859	632	430	286	179	115	91
20	6,720	6,570	3,910	2,397	1,770	1,294	965	768	512	315	212	142	106
22	7,266	6,675	4,191	2,543	1,939	1,385	1,070	827	596	396	284	179	123
24	7,813	6,763	4,750	2,694	2,109	1,509	1,127	885	640	445	317	191	137
26	8,267	6,816	4,750	2,929	2,327	1,640	1,100	904	677	487	342	194	146
30	8,861	7,400	4,914	3,417	2,619	1,911	1,287	1,005	796	562	387	218	168
40	9,477	9,477	6,321	4,248	3,468	2,590	1,755	1,357	1,172	820	527	349	257
60	9,477	9,477	9,477	6,191	5,166	3,948	2,692	2,059	1,688	1,075	796	528	409
78	9,477	9,477	9,477	7,892	6,652	5,135	3,540	2,700	2,216	1,411	942	594	453
97	11,164	10,149	9,477	9,477	8,037	6,243	4,465	3,420	2,707	1,725	1,151	726	554

Unique Supporting table - 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	1,000	1,200	1,600	2,000	2,600	3,500	4,500	5,500	6,500
0	1.12	1.40	1.45	1.18	0.91	0.75	0.75	0.75	0.75
1	1.12	1.40	1.45	1.18	0.91	0.75	0.75	0.75	0.75
1	1.12	1.40	1.45	1.18	0.91	0.75	0.75	0.75	0.75
1	1.23	1.49	1.48	1.19	0.96	1.04	1.04	1.04	1.04
1	1.35	1.55	1.43	1.24	1.02	1.22	1.22	1.29	1.29
2	1.26	1.47	1.46	1.27	1.24	1.50	1.50	1.50	1.50
2	1.11	1.27	1.31	1.37	1.54	1.63	1.63	1.63	1.63
4	1.25	1.30	1.27	1.29	1.25	1.42	1.42	1.42	1.42
8	1.25	1.30	1.27	1.29	1.25	1.42	1.42	1.42	1.42

Unique Supporting table - ZeroTorqueAFM

Description: Zero torque engine load while in Active Fuel Management. %of Max Brake Torque along the Neutral rev line, as a function of RPM and Baro

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

ZeroTorqueAFM - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
65	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
75	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
85	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
95	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
105	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90

ZeroTorqueAFM - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
65	1.90	1.90	1.90	1.90	1.90	1.90	1.90	3.28	4.71	6.13	7.56	8.99	10.42
75	1.90	1.90	1.90	1.90	1.90	1.90	1.90	3.28	4.71	6.13	7.56	8.99	10.42
85	1.90	1.90	1.90	1.90	1.90	1.90	1.90	3.28	4.71	6.13	7.56	8.99	10.42
95	1.90	1.90	1.90	1.90	1.90	1.90	1.90	3.28	4.71	6.13	7.56	8.99	10.42
105	1.90	1.90	1.90	1.90	1.90	1.90	1.90	3.28	4.71	6.13	7.56	8.99	10.42

Unique Supporting table - ZeroTorqueEngLoad

Description: %of Max Brake Torque that represents Zero Brake torque along the Neutral rev line, as a function of RPM and Baro

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

ZeroTorqueEngLoad - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
65	-2.70	-2.70	-2.70	-2.70	-2.25	-1.80	-1.20	0.10	0.80	0.65	0.25	-0.15	-0.60
75	-2.70	-2.70	-2.70	-2.70	-2.25	-1.80	-1.20	0.10	0.80	0.65	0.25	-0.15	-0.60
85	-2.70	-2.70	-2.70	-2.70	-2.25	-1.80	-1.20	0.10	0.80	0.65	0.25	-0.15	-0.60
95	-2.70	-2.70	-2.70	-2.70	-2.25	-1.80	-1.20	0.10	0.80	0.65	0.25	-0.15	-0.60
105	-2.70	-2.70	-2.70	-2.70	-2.25	-1.80	-1.20	0.10	0.80	0.65	0.25	-0.15	-0.60

ZeroTorqueEngLoad - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
65	-1.00	-1.20	-1.20	-1.20	-1.00	1.70	4.25	6.80	9.35	11.90	14.45	17.00	19.55
75	-1.00	-1.20	-1.20	-1.20	-1.00	1.70	4.25	6.80	9.35	11.90	14.45	17.00	19.55
85	-1.00	-1.20	-1.20	-1.20	-1.00	1.70	4.25	6.80	9.35	11.90	14.45	17.00	19.55
95	-1.00	-1.20	-1.20	-1.20	-1.00	1.70	4.25	6.80	9.35	11.90	14.45	17.00	19.55
105	-1.00	-1.20	-1.20	-1.20	-1.00	1.70	4.25	6.80	9.35	11.90	14.45	17.00	19.55

Unique 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	900

Unique Supporting table - Closed Loop Enable Clarification - KeWRSC_T_HtrCntrlCL

Description: WRAF heater temperature enabling threshold for transition from Open Loop to Closed Loop

Notes: Degrees Celcius

y/x	1
1	0

Unique Supporting table - Closed Loop Enable Clarification - KeWRSI_T_PumpCurrentEnable

Description: WRAF heater temperature threshold for enabling the sensor pump current

Notes: Degrees Celcius

y/x	1
1	600

Unique 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	40

Unique 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	600.0	600.0	600.0	480.0	400.0	240.0	240.0	240.0	40.0	40.0	40.0	40.0	40.0	20.0	20.0	20.0	20.0

Unique 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	100.0	100.0	100.0	55.0	19.0	18.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Unique 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	600.0	600.0	600.0	480.0	380.0	85.0	85.0	75.0	75.0	75.0	75.0	25.0	25.0	25.0	25.0	25.0	25.0

Unique Supporting table - P0234_KtBSTD_p_CntrlDevBasLim

Description: Overboost in open loop diagnose failure limit.

Notes:

y/x	60.00	70.00	80.00	90.00	100.00	110.00
1,000.00	90.000	90.000	80.000	70.000	60.000	60.000
2,000.00	62.000	52.000	32.000	30.000	30.000	30.000
3,000.00	42.000	25.000	10.000	10.000	10.000	10.000
4,000.00	30.000	10.000	10.000	10.000	10.000	10.000
5,000.00	30.000	10.000	10.000	10.000	10.000	10.000
6,000.00	30.000	10.000	10.000	10.000	10.000	10.000

Unique Supporting table - P0299_KtBSTD_p_CntrlDevDsrdRtHi

Description: Allowed positive rate limit on desired boost pressure. In allowed kPa per 100 ms.

Notes:

y/x	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	6,000
1	2.000	2.500	2.700	2.900	3.000	3.000	3.100	3.200	3.500	4.000

Unique 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	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4
2	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4
3	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4
4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4
5	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4
6	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4	-398.4
7	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4	-418.4
8	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3	-439.3
9	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4
10	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4
11	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4
12	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4
13	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4
14	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4
15	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4
16	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4
17	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4	-461.4

Unique Supporting table - P0442 Estimate of Ambient Temperature Valid Conditioning Time as a Function of Ign Off Time Table

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

Notes: KtOATC_t_EstIdleCondTimePreset

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

y/x	0	600	1,200	1,800	2,400	3,000	3,600	4,200	4,800	5,400	6,000	6,600	7,200	7,800	8,400	9,000	9,600
1	400	400	450	500	600	550	500	400	380	350	340	320	300	200	200	200	200

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

y/x	10,200	10,800	11,700	12,600	13,500	14,400	15,300	16,200	17,100	18,000	19,200	20,400	21,600	22,800	24,000	25,200	
1	200	200	200	200	100	100	100	100	100	100	100	100	100	100	100	100	

Unique 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	68	67	66	65	64	64	63	62	61	60	59	58	57	56	55	54	53

Unique 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	0	1	1	1	1	1	1	1

Unique Supporting table - CalculatedPerfMaxEc1

Description:

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
2	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
3	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
4	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
6	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
7	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
8	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
9	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
10	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
11	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
12	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
13	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
14	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
15	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
16	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
17	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5

Unique Supporting table - CalculatedPerfMaxEc2

Description:

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
2	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
3	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
4	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
6	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
7	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
8	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
9	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
10	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
11	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
12	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
13	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
14	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
15	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
16	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
17	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5

Unique Supporting table - CalculatedPerfMaxIc1

Description:

Notes:

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
2	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
3	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
4	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
7	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
8	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
9	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
10	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
11	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
12	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
13	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
14	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
15	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
16	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
17	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0

Unique Supporting table - CalculatedPerfMaxIc2

Description:

Notes:

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

Unique 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	11.1055	10.8086	10.8105	10.7129	10.4766	10.4766	10.4609	10.4785	10.4551	10.1074	10.1074	10.1074	10.1074	10.1074	10.1074	10.1074	10.1074

Unique 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

Unique 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	3.2715	3.1484	3.1602	3.1074	3.0234	3.0156	3.0273	3.0195	3.0176	2.8789	2.8789	2.8789	2.8789	2.8789	2.8789	2.8789	2.8789

Unique 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

Unique Supporting table - 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	1.087	1.024	0.843	0.625	0.546	0.382	0.293	0.319	0.272	0.282	0.280	0.280	0.280	0.280	0.280	0.280	0.280

Unique Supporting table - P0521_LowMinOilPresFail - Two Stage Oil Pump

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	108.0	125.0	123.0	132.0	140.0	133.0	126.0	119.0	112.0

Unique Supporting table - P0521_P06DD_P06DE_OP_HiStatePressure

Description: Two Stage Oil Pump Oil Pressure in High State

Notes: For P0521, 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	613.0	613.0	589.0	521.0	482.0	429.0	337.0	337.0	337.0
1,500.0	631.0	631.0	598.0	539.0	521.0	491.0	445.0	445.0	445.0
2,000.0	641.0	641.0	605.0	528.0	539.0	494.0	471.0	471.0	471.0
2,500.0	648.0	648.0	584.0	517.0	522.0	493.0	478.0	478.0	478.0
3,000.0	654.0	654.0	563.0	506.0	505.0	492.0	484.0	484.0	484.0
3,500.0	657.0	657.0	570.0	524.0	517.0	502.0	494.0	494.0	494.0
4,000.0	660.0	660.0	578.0	542.0	529.0	512.0	503.0	503.0	503.0
4,500.0	668.0	668.0	592.0	541.0	530.0	510.0	484.0	484.0	484.0
5,000.0	675.0	675.0	607.0	539.0	531.0	508.0	465.0	465.0	465.0

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

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

Notes: P0606, KaPISD_b_ProgSeqWatchEnbl

y/x	CeTSKR_e_CPU	CeTSKR_e_CPU2	CeTSKR_e_CPU3	CeTSKR_e_CPU4
CePISR_e_6p25msSeq	1	1	0	0
CePISR_e_12p5msSeq	1	1	0	0
CePISR_e_25msSeq	1	1	0	0
CePISR_e_LORES_C	1	0	0	0

Unique 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	0.045	0.043	0.045	0.047	0.049	0.055	0.063	0.066	0.072	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090

Unique 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	0.020	0.020	0.020	0.020	0.021	0.023	0.027	0.031	0.031	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041

Unique 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

Unique Supporting table - P06DD_P06DE_MinOilPressThresh

Description: Intrusive diagnostic minimum pressure limit that is a function of Engine Speed and Oil Temperature

Notes: For P06DD and P06DE: KtLUBD_p_InDiagMinPresThresh 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	192	192	167	153	138	123	108	108	108
1,500	227	227	174	152	143	136	125	125	125
2,000	214	214	177	147	143	133	123	123	123
2,500	233	233	192	149	144	137	132	132	132
3,000	252	252	206	151	145	142	140	140	140
3,500	246	246	187	149	142	137	133	133	133
4,000	239	239	168	147	139	133	126	126	126
4,500	246	246	179	137	132	126	119	119	119
5,000	253	253	190	126	124	118	112	112	112

Unique 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	342	342	317	303	288	273	258	258	258
1,500	377	377	324	302	293	286	275	275	275
2,000	364	364	327	297	293	283	273	273	273
2,500	383	383	342	299	294	287	282	282	282
3,000	402	402	356	301	295	292	290	290	290
3,500	396	396	337	299	292	287	283	283	283
4,000	389	389	318	297	289	283	276	276	276
4,500	396	396	329	287	282	276	269	269	269
5,000	403	403	340	276	274	268	262	262	262

Unique 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	135.0	135.0	136.0	109.0	97.0	78.0	40.0	40.0	40.0
1,500.0	127.0	127.0	137.0	119.0	114.0	102.0	85.0	85.0	85.0
2,000.0	138.0	138.0	139.0	116.0	123.0	106.0	99.0	99.0	99.0
2,500.0	132.0	132.0	121.0	109.0	114.0	103.0	98.0	98.0	98.0
3,000.0	126.0	126.0	103.0	103.0	105.0	100.0	97.0	97.0	97.0
3,500.0	131.0	131.0	117.0	113.0	112.0	107.0	106.0	106.0	106.0
4,000.0	136.0	136.0	130.0	122.0	120.0	114.0	114.0	114.0	114.0
4,500.0	136.0	136.0	132.0	127.0	124.0	117.0	107.0	107.0	107.0
5,000.0	136.0	136.0	134.0	131.0	129.0	120.0	101.0	101.0	101.0

Unique Supporting table - DFCO_CoolEnblHi_Temp

Description:

Notes:

y/x	-40	0	20
1	25.0	30.0	50.0

Unique Supporting table - DFCO_DsblLo_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	512	512
CeTGRR_e_TransGr2	20	20
CeTGRR_e_TransGr3	20	20
CeTGRR_e_TransGr4	0	0
CeTGRR_e_TransGr5	0	0
CeTGRR_e_TransGr6	0	0
CeTGRR_e_TransGrEVT1	512	512
CeTGRR_e_TransGrEVT2	512	512
CeTGRR_e_TransGrNeut	512	512
CeTGRR_e_TransGrRvrs	512	512
CeTGRR_e_TransGrPark	512	512
CeTGRR_e_TransGr7	0	0
CeTGRR_e_TransGr8	0	0

Unique Supporting table - DFCO_EnblHi_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	512.0	512.0
CeTGRR_e_TransGr2	30.0	30.0
CeTGRR_e_TransGr3	37.0	37.0
CeTGRR_e_TransGr4	20.0	20.0
CeTGRR_e_TransGr5	0.0	0.0
CeTGRR_e_TransGr6	0.0	0.0
CeTGRR_e_TransGrEVT1	512.0	512.0
CeTGRR_e_TransGrEVT2	512.0	512.0
CeTGRR_e_TransGrNeut	512.0	512.0
CeTGRR_e_TransGrRvrs	512.0	512.0
CeTGRR_e_TransGrPark	512.0	512.0
CeTGRR_e_TransGr7	0.0	0.0
CeTGRR_e_TransGr8	0.0	0.0

Unique Supporting table - DFCO_EngSpdEnblOfst

Description:

Notes:

y/x	-1,750	-1,500	-1,250	-1,000	-750	-500	-300	-100	0
1	500	500	500	50	0	0	0	0	0

Unique Supporting table - P0011_P0021_P05CC_P05CD_EngOilPressEnblIc

Description: Delay time before the oil pressure enable flag is set assuming all the oil pressure enable criteria are met

Notes: KtPHSC_t_EngOilPressEnblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0

Unique Supporting table - P0011_P0021_P05CC_P05CD_LoRpmHiEnblIc

Description: Intake cam is enabled when engine speed exceeds this value.

Notes: KtPHSC_n_LoRpmHiEnblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780

Unique Supporting table - P0011_P0021_P05CC_P05CD_LoRpmLoDsbllc

Description: Intake cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsbllc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740

Unique Supporting table - P0014_P0024_P05CE_P05CF_LoRpmHiEnblEc

Description: Exhaust cam is enabled when engine speed exceeds this value.

Notes: KtPHSC_n_LoRpmHiEnblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780

Unique Supporting table - P0014_P0024_P05CE_P05CF_LoRpmLoDsblEc

Description: Exhaust cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740

Unique Supporting table - P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold

Description: P0016, P0017, P0018, P0019: Cam Correlation Oil Temperature Threshold

Notes: KtPHSC_t_RtnHomeDlyLmt

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	300	300	7	3	2	2	2	2	2	2	2	2	2	2	2	2	2

Unique Supporting table - P00C4_P2261_KtBSTD_r_SurgeLim

Description: Turbo compressor bypass valve diagnosis surge area limit.

Notes:

y/x	7.40	18.60	47.37	71.53	97.92	129.60
1	1.250	1.650	2.148	2.754	3.072	3.432

Unique 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	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	0.830	1.000	0.968	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.698

Unique 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	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.963	1.000	1.000	1.000	0.662

Unique Supporting table - P0101, P0106, P0121, P012B, P0236, P1101: MAP3 Residual Weight Factor based on RPM

Description: P0101_P0106_P0121_P012B_P0236_P1101 MAP3 Residual Weight Factor based on RPM

Notes:

y/x	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.953	0.887	0.914	0.950	1.000	0.630	1.000

Unique 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	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1.000	1.000	1.000	1.000	0.684	1.000	0.759	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.540

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max Air Flow

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	6.0	8.0	10.0	6.0	8.0	9.0	12.0	13.0	13.0

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-Baro Correlation Max MAP

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	35.0	27.5	26.1	26.0	26.0	26.0	30.0	30.0	30.0

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min Air Flow

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	15.0	32.0	36.0	47.0	57.0	70.0	74.0	76.0	76.0

Unique Supporting table - P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP

Description: P0101_P0106_P0121_P0236_P1101 TIAP-MAP Correlation Min MAP

Notes:

y/x	1,000	1,750	2,500	3,250	4,000	4,750	5,500	6,250	7,000
1	100.0	100.0	120.0	155.0	170.0	160.0	150.0	162.0	170.0

Unique Supporting table - P0234_P0299_KtBSTD_p_CntrlDevAmbAirCorr

Description: Additative offset on boost pressure control deviation fail limit.

Notes:

y/x	60.00	70.00	80.00	90.00	95.00	110.00
1,500	75.00	63.00	26.00	17.00	8.00	0.00
2,500	67.50	55.50	23.00	15.33	8.00	0.00
3,000	53.79	41.36	18.00	11.00	5.00	0.00
4,000	60.86	47.57	20.29	8.76	3.00	0.00
5,000	66.43	52.29	25.14	10.38	3.00	0.00
6,000	75.00	60.00	30.00	12.00	3.00	0.00

Unique Supporting table - P0234_P0299_KtBSTD_t_CntrlDevEnblDelay

Description: Timer to stabilize enable conditions for over and underboost diagnosis.

Notes:

y/x	1,000	1,500	1,900	2,500	3,000	3,500	4,000	4,500	5,500	6,500
1	2.6250	2.0000	1.7500	1.5000	1.3750	1.2500	1.1250	1.0000	0.7500	0.6250

Unique Supporting table - P0299_KtBSTD_p_CntrlDevPosLim

Description: Positive boost pressure control deviation fail limit.

Notes:

y/x	105.00	114.00	120.00	130.00	140.00	150.00	160.00	170.00	180.00	220.00
1,000	4.00	9.00	16.60	20.00	31.00	41.00	50.50	60.00	70.50	96.00
1,500	4.00	9.00	16.60	20.00	31.00	41.00	50.50	60.00	70.50	96.00
1,900	4.00	9.00	16.10	21.00	29.00	39.00	48.50	58.00	68.50	96.00
2,500	4.00	8.00	13.10	18.00	26.00	36.00	43.05	50.09	59.64	85.09
3,000	4.00	6.00	14.87	18.00	24.75	28.50	34.00	43.50	52.25	76.00
3,500	4.00	6.00	10.15	12.00	16.00	20.00	27.00	37.33	43.75	70.00
4,000	4.00	6.00	8.11	10.00	15.00	20.00	20.00	31.17	35.00	40.00
4,500	4.00	6.00	8.11	10.00	15.00	20.00	20.00	25.00	35.00	40.00
5,500	4.00	6.00	8.11	10.00	15.00	20.00	20.00	25.00	35.00	40.00
6,500	4.00	6.00	8.11	10.00	15.00	20.00	20.00	25.00	35.00	40.00

Unique Supporting table - 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

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	75	87	99	110	122	128	118	119	156	159	161	164	171

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	179	186	193	201	207	213	219	223	228	234	240	247	250

Unique Supporting table -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.

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	900	900	900	900	900	900	900

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	900	900	900	900	900	900	

Unique Supporting table - 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.

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

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	

Unique Supporting table - VCE_MinVacReducedTorqMode

Description: Minimum Vacuum allowed in VCE mode

Notes: For P3400: KtVCEC_p_MinVacReducedTrqMode

VCE_MinVacReducedTorqMode - Part 1

y/x	500	600	700	800	900	1,000	1,100	1,200	1,300
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

VCE_MinVacReducedTorqMode - Part 2

y/x	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

VCE_MinVacReducedTorqMode - Part 3

y/x	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Unique Supporting table - 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

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	15	19	23	27	31	35	15

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	35	35	

Unique Supporting table - 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

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	75	87	99	110	122	128	118	119	156	159	161	164	171

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	179	186	193	201	207	213	219	223	228	234	240	247	250

Unique Supporting table - 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	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

Unique 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	18.95	19.70	14.20	19.48	14.28	31.40	35.20	56.65	255.00

Unique 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	40.13	36.99	20.80	19.78	11.14	22.44	21.73	18.77	255.00

Unique 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	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Unique Supporting table - P0101, P0106, P010B, P0121, P0236, P1101: MAF2 Residual Weight Factor based on RPM

Description: P0101_P0106_P010B_P0121_P0236_P1101 MAF2 Residual Weight Factor based on RPM

Notes:

y/x	600	950	1,300	1,650	2,000	2,350	2,700	3,050	3,400	3,750	4,100	4,450	4,800	5,150	5,500	6,000	6,500
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Unique Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest1

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

y/x	-16	-4	8	20	32	44	68
1	55,000	55,000	55,000	55,000	55,000	55,000	55,000

Unique Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest0

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

y/x	-16	-4	8	20	32	44	68
1	55,000	55,000	55,000	55,000	55,000	55,000	55,000

Unique 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	11.14	11.14	11.14	11.14	11.14	11.14

Unique 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	18.31	16.81	19.45	25.73	30.61	29.80	31.81	33.83	30.11	25.64	21.88	19.16	17.84	17.84	17.84	17.84
160.00	125.00	17.41	15.89	18.02	22.69	24.94	25.69	27.81	29.95	27.16	23.75	20.77	18.41	17.28	17.28	17.28	17.28
240.00	125.00	16.58	15.08	16.78	20.03	21.06	22.58	24.72	26.88	24.78	22.16	19.77	17.73	16.75	16.75	16.75	16.75
320.00	125.00	15.84	14.34	15.72	17.45	18.20	19.97	22.02	24.06	22.59	20.70	18.86	17.09	16.25	16.25	16.25	16.25
400.00	125.00	15.16	13.67	14.77	15.47	15.92	17.56	19.64	21.72	20.77	19.44	18.03	16.52	15.78	15.78	15.78	15.78
480.00	125.00	14.53	13.08	13.84	13.44	14.14	15.67	17.73	19.78	19.16	18.20	16.94	15.23	14.41	14.41	14.41	14.41
560.00	125.00	13.95	12.53	12.31	11.73	12.47	14.16	16.16	18.17	17.52	16.53	15.31	13.75	12.98	12.98	12.98	12.98
640.00	125.00	13.42	11.81	11.05	10.41	11.14	12.91	14.86	16.80	16.14	15.14	13.95	12.44	11.72	11.72	11.72	11.72
720.00	125.00	12.94	10.91	9.98	9.34	10.08	11.86	13.73	15.63	14.95	13.97	12.81	11.38	10.67	10.67	10.67	10.67
800.00	125.00	12.22	9.92	9.09	8.48	9.20	10.97	12.77	14.58	13.92	12.97	11.83	10.44	9.77	9.77	9.77	9.77
880.00	125.00	11.20	9.11	8.36	7.77	8.47	10.20	11.92	13.66	13.02	12.09	10.98	9.64	9.00	9.00	9.00	9.00
960.00	125.00	10.36	8.41	7.73	7.17	7.84	9.53	11.17	12.81	12.22	11.31	10.27	8.97	8.34	8.34	8.34	8.34
1,040.00	125.00	9.63	7.81	7.19	6.66	7.30	8.94	10.50	12.08	11.50	10.64	9.63	8.38	7.78	7.78	7.78	7.78
1,120.00	125.00	8.98	7.30	6.72	6.20	6.81	8.39	9.91	11.42	10.86	10.03	9.06	7.86	7.28	7.28	7.28	7.28
1,200.00	125.00	8.42	6.84	6.31	5.81	6.41	7.92	9.38	10.83	10.28	9.50	8.56	7.41	6.84	6.84	6.84	6.84
1,280.00	125.00	8.11	6.59	6.08	5.59	6.17	7.66	9.06	10.48	9.97	9.19	8.28	7.14	6.59	6.59	6.59	6.59
1,360.00	125.00	8.11	6.59	6.08	5.59	6.17	7.66	9.06	10.48	9.97	9.19	8.28	7.14	6.59	6.59	6.59	6.59

Unique Supporting table - EngineOverSpeedLimit

Description: Engine OverSpeed Limit versus gear

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

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	6,500	6,500	6,500	6,500	6,500	6,500	3,200

EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	3,200	3,200	6,500	3,200	6,500	6,500	

Unique 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	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Unique 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	-20	-10	0	8	16	20	24	32	40	48	64	80	90	112
0	18.0	18.0	18.0	16.0	12.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
13	18.0	18.0	18.0	16.0	12.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
25	18.0	18.0	18.0	16.0	12.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
38	18.0	18.0	18.0	16.0	12.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
50	18.0	18.0	18.0	16.0	12.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
63	18.0	18.0	18.0	16.0	12.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	4.0
75	18.0	18.0	18.0	16.0	12.0	8.0	8.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	4.0
88	18.0	18.0	18.0	16.0	12.0	8.0	8.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	4.0
100	18.0	18.0	18.0	16.0	12.0	8.0	8.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	4.0

Unique 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	-20	-10	0	8	16	20	24	32	40	48	64	80	90	112
0	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
13	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
38	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
50	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
63	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
75	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
88	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
100	2.0	2.0	2.0	2.0	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Unique 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	1,000	1,200	1,400	1,590	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	26.50	18.00	13.25	18.75	11.00	6.50	6.00	7.75	8.00	7.00	8.75	0.00	0.00
195	0.00	0.00	0.00	0.00	25.50	15.75	22.00	14.00	10.00	9.25	8.00	6.50	6.25	3.00	0.00	0.00	0.00
220	0.00	0.00	0.00	0.00	39.00	27.00	17.75	18.50	18.00	9.00	10.50	9.25	6.50	5.00	0.00	0.00	0.00
240	0.00	0.00	0.00	0.00	61.50	32.00	20.50	21.00	17.75	11.00	8.00	8.50	7.25	6.50	0.00	0.00	0.00
260	0.00	0.00	0.00	0.00	80.75	41.00	27.25	27.50	20.75	16.50	10.75	10.75	10.75	8.75	0.00	0.00	0.00
280	0.00	0.00	0.00	0.00	72.75	40.00	27.25	27.75	25.50	21.00	15.00	14.00	14.25	10.75	0.00	0.00	0.00
300	0.00	0.00	0.00	0.00	79.50	47.75	38.25	29.75	32.25	30.00	19.50	21.50	13.50	12.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	91.50	59.75	50.00	37.25	37.25	40.00	29.50	26.50	17.75	16.50	0.00	0.00	0.00
340	0.00	0.00	0.00	0.00	108.50	73.25	69.00	48.25	40.50	46.50	42.00	41.25	28.50	27.50	0.00	0.00	0.00
360	0.00	0.00	0.00	0.00	119.25	93.75	81.75	61.25	54.25	55.50	57.50	51.50	42.00	39.00	0.00	0.00	0.00
380	0.00	0.00	0.00	0.00	129.25	108.75	92.75	82.00	61.50	61.25	59.75	57.75	47.50	43.25	0.00	0.00	0.00
405	0.00	0.00	0.00	0.00	153.75	129.75	108.00	108.00	83.00	64.50	64.00	53.50	48.00	48.25	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	0.00	164.50	140.75	109.00	115.25	103.00	60.25	58.25	57.00	60.00	0.00	0.00	0.00
480	0.00	0.00	0.00	0.00	0.00	195.50	178.00	122.00	155.00	90.25	82.25	83.50	86.50	0.00	0.00	0.00	0.00
520	0.00	0.00	0.00	0.00	0.00	200.00	167.25	174.25	103.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	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

Unique 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	1,000	1,200	1,400	1,590	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	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
195	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
220	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
240	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
260	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
280	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
300	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
320	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
340	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
360	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
380	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
405	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
440	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
480	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
520	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
560	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

Unique 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	1,000	1,200	1,400	1,590	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	10.50	15.50	12.50	9.00	8.75	13.00	11.50	7.75	6.75	7.00	4.50	0.00	0.00
195	0.00	0.00	0.00	0.00	19.75	21.00	12.25	13.25	11.50	11.50	9.50	8.50	7.50	8.50	0.00	0.00	0.00
220	0.00	0.00	0.00	0.00	20.50	18.00	16.50	14.50	12.00	12.50	9.25	7.50	6.50	6.50	0.00	0.00	0.00
240	0.00	0.00	0.00	0.00	23.50	18.00	18.25	15.00	14.50	10.50	9.75	9.25	7.25	7.00	0.00	0.00	0.00
260	0.00	0.00	0.00	0.00	24.00	19.75	19.25	18.00	16.00	12.25	12.25	10.00	8.00	8.50	0.00	0.00	0.00
280	0.00	0.00	0.00	0.00	26.00	24.50	24.50	21.25	18.75	13.50	14.50	11.75	8.75	10.00	0.00	0.00	0.00
300	0.00	0.00	0.00	0.00	26.75	29.50	26.25	26.25	19.50	17.50	16.25	13.25	12.50	12.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	33.00	35.25	30.25	29.25	25.50	20.50	18.50	15.00	13.50	14.00	0.00	0.00	0.00
340	0.00	0.00	0.00	0.00	35.00	34.75	29.50	33.00	29.00	22.50	22.00	17.50	15.75	15.75	0.00	0.00	0.00
360	0.00	0.00	0.00	0.00	41.50	40.00	31.50	34.75	29.00	25.50	25.00	19.50	18.75	15.50	0.00	0.00	0.00
380	0.00	0.00	0.00	0.00	46.50	45.25	33.50	33.00	33.00	26.75	26.25	21.50	16.50	17.50	0.00	0.00	0.00
405	0.00	0.00	0.00	0.00	45.25	43.50	36.00	35.00	35.25	31.50	26.75	21.75	18.00	20.25	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	0.00	44.75	36.50	39.00	35.25	33.75	28.00	27.50	22.25	23.75	0.00	0.00	0.00
480	0.00	0.00	0.00	0.00	0.00	48.00	44.75	43.25	38.75	36.75	32.75	30.50	25.25	0.00	0.00	0.00	0.00
520	0.00	0.00	0.00	0.00	0.00	50.50	51.75	44.50	38.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	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

Unique 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	1,000	1,200	1,400	1,590	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	1.00	1.00	18.75	15.75	14.25	16.75	11.50	9.25	6.75	5.50	5.25	6.00	5.00	0.00	0.00
195	0.00	0.00	0.00	0.00	35.50	29.75	19.75	15.00	15.00	15.75	13.75	9.50	6.50	8.75	0.00	0.00	0.00
220	0.00	0.00	0.00	0.00	51.00	40.00	30.25	29.50	22.00	22.00	22.50	17.50	15.50	19.75	0.00	0.00	0.00
240	0.00	0.00	0.00	0.00	90.75	58.50	65.50	54.50	59.25	42.25	35.75	24.25	23.50	24.00	0.00	0.00	0.00
260	0.00	0.00	0.00	0.00	139.25	97.75	92.75	91.00	78.50	54.25	46.75	32.75	27.75	24.25	0.00	0.00	0.00
280	0.00	0.00	0.00	0.00	163.75	126.25	113.75	96.75	85.00	65.00	59.50	42.75	28.50	28.00	0.00	0.00	0.00
300	0.00	0.00	0.00	0.00	187.25	131.00	128.00	109.75	96.00	88.50	66.00	60.00	35.75	38.50	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	187.50	150.75	134.50	119.00	109.50	112.00	98.00	69.50	54.75	47.25	0.00	0.00	0.00
340	0.00	0.00	0.00	0.00	188.75	172.75	163.50	157.00	131.75	142.00	132.00	95.75	67.25	69.50	0.00	0.00	0.00
360	0.00	0.00	0.00	0.00	208.50	197.00	197.00	183.75	163.50	150.50	152.75	120.25	103.00	99.00	0.00	0.00	0.00
380	0.00	0.00	0.00	0.00	233.50	226.75	223.50	178.75	184.25	172.25	162.50	141.75	136.25	114.50	0.00	0.00	0.00
405	0.00	0.00	0.00	0.00	266.00	253.50	240.00	190.00	200.00	188.75	170.00	163.00	139.75	111.25	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	0.00	293.00	271.25	211.25	180.50	214.00	194.50	178.00	155.00	136.25	0.00	0.00	0.00
480	0.00	0.00	0.00	0.00	0.00	302.50	301.00	274.75	185.50	145.00	141.00	220.25	203.25	0.00	0.00	0.00	0.00
520	0.00	0.00	0.00	0.00	0.00	314.75	315.00	295.50	167.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	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

Unique 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	1,000	1,200	1,400	1,590	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	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
195	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
220	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
240	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
260	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
280	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
300	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
320	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
340	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
360	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
380	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
405	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
440	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
480	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
520	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
560	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

Unique 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	1,000	1,200	1,400	1,590	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	22.00	24.50	8.00	8.75	9.75	6.50	7.75	9.50	9.50	9.50	8.00	7.00	6.75	0.00	0.00
195	0.00	0.00	0.00	0.00	17.50	15.50	14.25	15.00	13.25	12.50	12.00	12.50	13.75	10.00	0.00	0.00	0.00
220	0.00	0.00	0.00	0.00	25.25	20.75	20.00	19.25	19.25	14.75	15.25	16.00	14.75	10.00	0.00	0.00	0.00
240	0.00	0.00	0.00	0.00	21.50	19.50	18.75	19.75	17.75	18.75	16.00	17.50	17.00	12.00	0.00	0.00	0.00
260	0.00	0.00	0.00	0.00	20.75	18.00	21.25	19.00	18.50	20.25	18.75	19.00	18.25	13.25	0.00	0.00	0.00
280	0.00	0.00	0.00	0.00	19.00	18.00	21.00	19.75	17.25	22.50	20.25	20.50	20.50	17.00	0.00	0.00	0.00
300	0.00	0.00	0.00	0.00	22.25	20.75	22.00	19.00	17.50	24.25	23.25	21.75	21.50	18.25	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	26.75	21.75	23.00	25.50	21.75	23.50	24.25	25.25	23.00	21.00	0.00	0.00	0.00
340	0.00	0.00	0.00	0.00	29.00	26.75	26.00	24.00	23.50	23.00	25.25	25.50	24.50	25.75	0.00	0.00	0.00
360	0.00	0.00	0.00	0.00	28.50	32.00	25.00	26.75	24.50	23.50	23.25	28.00	26.00	24.50	0.00	0.00	0.00
380	0.00	0.00	0.00	0.00	30.00	29.50	24.50	26.50	26.50	24.00	22.25	24.50	23.00	25.00	0.00	0.00	0.00
405	0.00	0.00	0.00	0.00	26.25	30.00	27.50	29.50	26.25	24.25	24.00	26.50	21.75	23.50	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	0.00	25.00	23.75	24.50	29.00	27.75	26.50	26.00	26.50	32.00	0.00	0.00	0.00
480	0.00	0.00	0.00	0.00	0.00	30.00	23.50	23.00	28.00	27.50	28.75	28.00	28.25	0.00	0.00	0.00	0.00
520	0.00	0.00	0.00	0.00	0.00	36.00	32.75	21.00	24.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	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

Unique Supporting table - Closed Loop Enable Clarification - KeWRSC_T_HtrCntrlCL

Description: WRAF heater temperature enabling threshold for transition from Open Loop to Closed Loop

Notes: Degrees Celcius

y/x	1
1	628

Unique 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	45

Unique 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	600.0	600.0	600.0	400.0	200.0	200.0	200.0	200.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0

Unique Supporting table - P0234_KtBSTD_p_CntrlDevBasLim

Description: Overboost in open loop diagnose failure limit.

Notes:

y/x	60.00	70.00	80.00	90.00	95.00	110.00
1,500.00	8.000	8.000	8.000	8.000	8.000	8.000
2,500.00	15.000	15.000	15.000	15.000	15.000	15.000
3,000.00	15.000	15.000	15.000	15.000	15.000	15.000
4,000.00	15.000	15.000	15.000	15.000	15.000	15.000
5,000.00	15.000	15.000	15.000	15.000	15.000	15.000
6,000.00	15.000	15.000	15.000	15.000	15.000	15.000

Unique Supporting table - P0299_KtBSTD_p_CntrlDevDsrdRtLo

Description: Allowed negative rate limit on desired boost pressure. In allowed kPa per 100 ms.

Notes:

y/x	1,000	1,500	1,900	2,500	3,000	3,500	4,000	4,500	5,500	6,500
1	-6.00	-10.00	-30.00	-80.00	-150.00	-200.00	-200.00	-200.00	-200.00	-200.00

Unique 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

Unique 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

Unique 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	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
2	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
3	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
5	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
6	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
7	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
8	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
9	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
10	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
11	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
12	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
13	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
14	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
15	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
16	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4
17	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4	-597.4

Unique Supporting table - P0442 Estimate of Ambient Temperature Valid Conditioning Time as a Function of Ign Off Time Table

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

Notes: KtOATC_t_EstIdleCondTimePreset

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

y/x	0	600	1,200	1,800	2,400	3,000	3,600	4,200	4,800	5,400	6,000	6,600	7,200	7,800	8,400	9,000	9,600
1	300	450	500	600	650	650	650	650	650	650	625	600	575	550	525	500	480

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

y/x	10,200	10,800	11,700	12,600	13,500	14,400	15,300	16,200	17,100	18,000	19,200	20,400	21,600	22,800	24,000	25,200	
1	460	440	420	400	380	360	340	320	300	280	260	240	220	200	200	200	

Unique 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	10.9668	10.9727	10.9551	10.9121	10.8457	10.7539	10.6367	10.4922	10.3262	10.1328	9.9160	9.6738	9.4063	9.1133	8.7969	8.4531	8.0859

Unique 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	3.7070	3.6953	3.6797	3.6563	3.6289	3.5957	3.5566	3.5117	3.4629	3.4082	3.3477	3.2832	3.2129	3.1367	3.0547	2.9688	2.8770

Unique Supporting table - 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	0.060	0.060	0.060	0.060	0.060	0.069	0.149	0.239	0.340	0.449	0.569	0.699	0.840	0.840	0.840	0.840	0.840

Unique Supporting table - P0521_LowMinOilPresFail - Two Stage Oil Pump

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	25.0	32.0	38.0	45.0	52.0	59.0	65.0	68.0	71.0

Unique Supporting table - P0521_P06DD_P06DE_OP_HiStatePressure

Description: Two Stage Oil Pump Oil Pressure in High State

Notes: For P0521, 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	760.0	727.8	635.9	543.9	450.3	424.2	398.1	385.0	385.0
1,500.0	763.3	731.2	639.3	547.5	459.8	439.9	419.9	410.0	410.0
2,000.0	766.7	734.6	642.8	551.0	469.2	459.5	449.8	445.0	445.0
2,500.0	770.0	737.9	646.2	554.4	478.6	474.1	471.4	470.0	470.0
3,000.0	773.3	741.2	649.4	557.7	487.8	480.6	473.6	470.0	470.0
3,500.0	776.7	744.6	652.7	560.8	496.9	486.2	475.4	470.0	470.0
4,000.0	780.0	747.8	655.9	564.0	506.1	491.7	477.3	470.0	470.0
5,500.0	790.0	757.9	666.3	574.7	534.5	508.7	482.9	470.0	470.0
7,000.0	800.0	768.3	677.8	587.3	565.1	527.1	489.0	470.0	470.0

Unique 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	0.232	0.240	0.266	0.285	0.365	0.361	0.336	0.510	1.633	1.779	3.127	3.127	3.127	3.127	3.127	3.127	3.127

Unique 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	0.137	0.139	0.154	0.164	0.189	0.201	0.186	0.236	0.732	0.777	0.963	0.963	0.963	0.963	0.963	0.963	0.963

Unique 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	0.0	0.0	190.0	190.0	190.0	190.0	190.0	0.0	0.0

Unique 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	415	399	354	310	267	224	182	161	139
1,500	428	412	368	324	282	239	198	177	156
2,000	440	425	381	339	297	255	214	193	172
2,500	453	438	395	353	311	270	230	209	189
3,000	465	450	409	367	326	286	246	226	205
3,500	478	463	422	382	341	302	262	242	222
4,000	490	476	436	396	356	317	278	258	238
5,500	528	515	477	439	401	364	326	307	288
7,000	566	554	518	482	446	410	374	356	338

Unique 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	113.8	108.4	92.9	77.3	57.8	38.4	18.9	18.9	18.9
1,500.0	110.8	105.3	89.6	73.7	55.8	38.0	20.1	20.1	20.1
2,000.0	107.8	102.2	86.3	70.1	53.9	37.6	21.3	21.3	21.3
2,500.0	104.8	99.1	82.9	66.5	51.6	36.6	21.7	21.7	21.7
3,000.0	101.8	95.9	79.4	62.8	49.3	35.6	22.1	22.1	22.1
3,500.0	98.7	92.8	76.0	59.1	46.9	34.7	22.4	22.4	22.4
4,000.0	95.7	89.7	72.6	55.4	44.5	33.7	22.8	22.8	22.8
5,500.0	86.5	80.3	62.5	44.7	37.8	30.9	23.9	23.9	23.9
7,000.0	77.2	70.9	52.8	34.8	31.5	28.3	25.1	25.1	25.1

Unique Supporting table - P156B_On_Test_Threshold

Description: AC High Side Pressure Sensor Rationality On Test Threshold

Notes: For P156B: KtACCD_p_HSPRat_OnTestPresMin with X Axis is defined by KnACCD_T_HSPRat_OnTestPresMin

y/x	0	25	45	70	100
1	500.0	800.0	1,100.0	1,400.0	1,700.0

Unique Supporting table - P156C_Cold_Test_Threshold

Description: AC High Side Pressure Sensor Rationality Cold Test Threshold

Notes: For P156C: KtACCD_p_HSPRat_ColdTestTarget with X Axis is defined by KnACCD_T_HSPRat_ColdTestTarget

y/x	-20	0	20	60	100
1	250	350	500	700	900

Unique Supporting table - DFCO_DsblLo_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	512	512
CeTGRR_e_TransGr2	0	0
CeTGRR_e_TransGr3	0	0
CeTGRR_e_TransGr4	0	0
CeTGRR_e_TransGr5	0	0
CeTGRR_e_TransGr6	0	0
CeTGRR_e_TransGrEVT1	512	512
CeTGRR_e_TransGrEVT2	512	512
CeTGRR_e_TransGrNeut	512	512
CeTGRR_e_TransGrRvrs	512	512
CeTGRR_e_TransGrPark	512	512
CeTGRR_e_TransGr7	0	0
CeTGRR_e_TransGr8	0	0

Unique Supporting table - DFCO_EnblHi_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	512.0	512.0
CeTGRR_e_TransGr2	0.0	0.0
CeTGRR_e_TransGr3	0.0	0.0
CeTGRR_e_TransGr4	0.0	0.0
CeTGRR_e_TransGr5	0.0	0.0
CeTGRR_e_TransGr6	0.0	0.0
CeTGRR_e_TransGrEVT1	512.0	512.0
CeTGRR_e_TransGrEVT2	512.0	512.0
CeTGRR_e_TransGrNeut	512.0	512.0
CeTGRR_e_TransGrRvrs	512.0	512.0
CeTGRR_e_TransGrPark	512.0	512.0
CeTGRR_e_TransGr7	0.0	0.0
CeTGRR_e_TransGr8	0.0	0.0

Unique Supporting table - 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

VCE_ECOMode_MaxTorque_Gr5 - Part 1													
y/x	800	888	976	1,064	1,152	1,240	1,328	1,416	1,504	1,592	1,680	1,768	1,856
1	10	10	100	100	100	100	115	135	155	160	190	200	200

VCE_ECOMode_MaxTorque_Gr5 - Part 2													
y/x	1,944	2,032	2,120	2,208	2,296	2,384	2,472	2,560	2,648	2,736	2,824	2,912	3,000
1	200	200	200	200	200	200	200	200	200	200	200	200	200

Unique Supporting table - 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

VCE_NormalMode_MaxTorque_Gr5 - Part 1

y/x	800	888	976	1,064	1,152	1,240	1,328	1,416	1,504	1,592	1,680	1,768	1,856
1	10	10	100	100	100	100	115	135	155	160	190	200	200

VCE_NormalMode_MaxTorque_Gr5 - Part 2

y/x	1,944	2,032	2,120	2,208	2,296	2,384	2,472	2,560	2,648	2,736	2,824	2,912	3,000
1	200	200	200	200	200	200	200	200	200	200	200	200	200

Unique 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	30.13	25.91	19.83	15.61	15.27	16.50	16.38	15.14	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
160.00	125.00	22.44	20.22	17.17	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
240.00	125.00	17.59	16.34	15.22	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
320.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
400.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
480.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
560.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
640.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
720.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
800.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
880.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
960.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,040.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,120.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,200.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,280.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1,360.00	125.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00

Unique 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	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
2	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
3	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
4	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
5	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
6	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
7	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
8	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
9	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
10	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
11	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
12	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
13	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
14	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
15	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
16	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1
17	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1	-274.1

Unique Supporting table - Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests

Description: KaPOPD_PostCellEnbl - A table of adaptive (Block Learn) cells in which to enable the post oxygen sensor tests.

Notes: Note: When Table column headings match the calibration value below it, that indivdual cell is enabled.

Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 1				
y/x	CeFADR_e_Cell00_PurgOnAirMode5	CeFADR_e_Cell01_PurgOnAirMode4	CeFADR_e_Cell02_PurgOnAirMode3	CeFADR_e_Cell03_PurgOnAirMode2
1	CeFADR_e_Cell07_PurgOnDecel	CeFADR_e_Cell07_PurgOnDecel	CeFADR_e_Cell07_PurgOnDecel	CeFADR_e_Cell07_PurgOnDecel
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 2				
y/x	CeFADR_e_Cell04_PurgOnAirMode1	CeFADR_e_Cell05_PurgOnAirMode0	CeFADR_e_Cell06_PurgOnIdle	CeFADR_e_Cell07_PurgOnDecel
1	CeFADR_e_Cell07_PurgOnDecel	CeFADR_e_Cell07_PurgOnDecel	CeFADR_e_Cell07_PurgOnDecel	CeFADR_e_Cell07_PurgOnDecel
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 3				
y/x	CeFADR_e_Cell08_PurgOffAirMode5	CeFADR_e_Cell09_PurgOffAirMode4	CeFADR_e_Cell10_PurgOffAirMode3	CeFADR_e_Cell11_PurgOffAirMode2
1	CeFADR_e_Cell15_PurgOffDecel	CeFADR_e_Cell15_PurgOffDecel	CeFADR_e_Cell15_PurgOffDecel	CeFADR_e_Cell15_PurgOffDecel
Multiple DTC Use - Block learn cells to enable Post oxygen sensor tests - Part 4				
y/x	CeFADR_e_Cell12_PurgOffAirMode1	CeFADR_e_Cell13_PurgOffAirMode0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
1	CeFADR_e_Cell15_PurgOffDecel	CeFADR_e_Cell15_PurgOffDecel	CeFADR_e_Cell15_PurgOffDecel	CeFADR_e_Cell15_PurgOffDecel

Unique Supporting table - P0011_P0021_P05CC_P05CD_LoRpmHiEnblIc

Description: Intake cam is enabled when engine speed exceeds this value.

Notes: KtPHSC_n_LoRpmHiEnblIc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	800	1,000

Unique Supporting table - P0011_P0021_P05CC_P05CD_LoRpmLoDsbllc

Description: Intake cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsbllc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	750	850

Unique Supporting table - P0014_P0024_P05CE_P05CF_LoRpmHiEnblEc

Description: Exhaust cam is enabled when engine speed exceeds this value.

Notes: KtPHSC_n_LoRpmHiEnblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	800	1,000

Unique Supporting table - P0014_P0024_P05CE_P05CF_LoRpmLoDsblEc

Description: Exhaust cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	750	850

Unique 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	500	1,000	1,250	1,500	1,750	2,000	2,250	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	1.000	1.000	0.946	0.896	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.673

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

Description: KaEOSD_x_ST_ResponseLimRS1[x][y]

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

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

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

Description: KaEOSD_x_ST_ResponseLimRS2[x][y]

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

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

Unique Supporting table - P226B_KtBSTD_r_ExcsvBstPresLim

Description: Compressor pressure ratio fail limit for excessive boost pressure diagnosis.

Notes:

y/x	100.000	130.000	160.000	185.000	200.000	215.000	225.000	235.000
1	2.500	2.500	2.500	2.500	2.500	2.000	1.800	1.400

Unique Supporting table - DFCO_DsblLo_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	0	0
CeTGRR_e_TransGr2	0	0
CeTGRR_e_TransGr3	0	0
CeTGRR_e_TransGr4	0	0
CeTGRR_e_TransGr5	0	0
CeTGRR_e_TransGr6	0	0
CeTGRR_e_TransGrEVT1	0	0
CeTGRR_e_TransGrEVT2	0	0
CeTGRR_e_TransGrNeut	0	0
CeTGRR_e_TransGrRvrs	0	0
CeTGRR_e_TransGrPark	0	0
CeTGRR_e_TransGr7	0	0
CeTGRR_e_TransGr8	0	0

Unique Supporting table - DFCO_EnblHi_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	512.0	512.0
CeTGRR_e_TransGr2	0.0	0.0
CeTGRR_e_TransGr3	0.0	0.0
CeTGRR_e_TransGr4	53.5	53.5
CeTGRR_e_TransGr5	53.5	53.5
CeTGRR_e_TransGr6	53.5	53.5
CeTGRR_e_TransGrEVT1	512.0	512.0
CeTGRR_e_TransGrEVT2	512.0	512.0
CeTGRR_e_TransGrNeut	512.0	512.0
CeTGRR_e_TransGrRvrs	512.0	512.0
CeTGRR_e_TransGrPark	512.0	512.0
CeTGRR_e_TransGr7	512.0	512.0
CeTGRR_e_TransGr8	512.0	512.0

Unique 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	-32	-24	-16	-8	0	8	16	20	24	32	40	48	64	80	96	112
0	15.0	15.0	10.0	8.0	5.5	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
13	15.0	15.0	10.0	8.0	5.5	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	3.0
25	15.0	15.0	10.0	8.0	5.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38	15.0	15.0	12.0	9.0	6.1	4.4	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
50	15.0	15.0	15.0	12.0	8.0	5.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
63	15.0	15.0	15.0	15.0	11.0	7.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
75	15.0	15.0	15.0	15.0	12.0	9.0	5.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
88	15.0	15.0	15.0	15.0	15.0	13.0	8.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
100	15.0	15.0	15.0	15.0	15.0	13.0	10.0	6.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Unique 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	-32	-24	-16	-8	0	8	16	20	24	32	40	48	64	80	96	112
1	11.0	11.0	10.4	9.6	8.6	7.0	5.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.5	5.0

Unique Supporting table - P0011_P0021_P05CC_P05CD_LoRpmLoDsbllc

Description: Intake cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsbllc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850

Unique Supporting table - P0014_P0024_P05CE_P05CF_LoRpmLoDsblEc

Description: Exhaust cam is disabled when engine speed is below this value.

Notes: KtPHSC_n_LoRpmLoDsblEc

y/x	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
1	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850

Unique Supporting table -P0234_KtBSTD_p_CntrlDevNegLim

Description: Negative boost pressure control deviation fail limit.

Notes:

y/x	5.00	50.00	100.00	150.00	200.00	250.00	300.00	350.00	400.00	450.00
1,000	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-20.00	-20.00
1,500	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-10.00	-10.00
2,000	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2,500	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
3,000	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
3,500	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
4,000	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
4,500	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
5,000	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-20.00	-30.00	-40.00
6,000	-30.00	-30.00	-20.00	-20.00	-20.00	-20.00	-30.00	-40.00	-12.00	-12.00

Unique Supporting table - P0299_KtBSTD_p_CntrlDevPosLim

Description: Positive boost pressure control deviation fail limit.

Notes:

y/x	5.00	50.00	100.00	150.00	200.00	250.00	300.00	350.00	400.00	450.00
1,000	15.00	15.00	15.00	15.00	5.00	30.00	30.00	30.00	20.00	20.00
1,500	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	10.00	10.00
2,000	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
2,500	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
3,000	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
3,500	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
4,000	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
4,500	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
5,000	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	30.00	40.00
6,000	30.00	30.00	20.00	20.00	20.00	20.00	30.00	40.00	25.00	25.00

Unique 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	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	100.00
1.00	18.73	20.66	25.93	28.33	45.33	255.00	255.00	255.00	255.00

Unique 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	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	100.00
1.00	22.97	24.76	22.80	13.31	18.84	255.00	255.00	255.00	255.00

Unique 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	500	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,500	4,000	4,500	5,000	5,500	6,500	7,500
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Unique 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	13.31	13.31	13.31	13.31	13.31	13.31

Unique 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	20.23	25.64	33.63	37.38	32.22	31.05	32.02	34.73	35.58	36.20	33.19	24.55	15.91	15.00	15.00	15.00
160.00	125.00	20.28	25.13	31.75	35.91	30.63	28.53	28.06	28.92	30.34	31.84	29.97	22.86	15.75	15.00	15.00	15.00
240.00	125.00	20.33	24.66	30.08	34.55	29.19	26.41	25.03	24.80	26.52	28.47	27.41	21.69	15.95	15.34	15.34	15.34
320.00	125.00	20.39	24.20	28.58	33.28	27.89	24.61	22.63	21.72	23.56	25.75	25.63	21.86	18.11	17.70	17.70	17.70
400.00	125.00	20.02	23.77	27.22	32.11	26.72	23.05	20.66	19.31	21.22	23.53	24.09	21.95	19.81	19.59	19.59	19.59
480.00	125.00	19.48	23.22	25.98	30.95	24.64	20.64	18.30	17.33	19.00	21.02	21.47	19.47	17.47	17.27	17.27	17.27
560.00	125.00	18.88	22.09	24.80	29.16	22.08	18.31	16.23	15.53	17.08	18.92	19.31	17.47	15.63	15.42	15.42	15.42
640.00	125.00	17.19	20.00	23.25	26.44	20.00	16.55	15.00	15.00	16.14	17.42	17.70	16.42	15.14	15.00	15.00	15.00
720.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00
800.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00
880.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00
960.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00
1,040.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00
1,120.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00
1,200.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00
1,280.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00
1,360.00	125.00	15.73	18.44	21.59	24.39	18.63	16.13	15.00	15.00	15.66	16.41	16.56	15.81	15.08	15.00	15.00	15.00

Unique 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
350.00	323.25	174.76	234.68	323.25	187.22	107.46
450.00	277.83	152.09	197.19	274.30	152.79	88.81
550.00	210.78	113.14	144.35	194.79	92.41	43.08
650.00	201.06	114.03	140.49	185.49	97.08	54.74
750.00	194.28	113.69	134.61	172.98	97.51	53.52
850.00	190.24	109.78	120.73	152.76	83.78	40.67
950.00	190.53	118.37	113.42	138.04	70.79	34.90
1,050.00	206.50	133.33	115.76	135.03	66.27	32.80
1,150.00	207.61	128.84	118.67	137.06	63.58	30.37
1,400.00	177.74	120.23	124.31	144.18	56.91	22.83
1,650.00	154.86	99.96	95.09	104.96	33.69	8.21
1,900.00	147.31	92.82	89.16	99.03	27.76	2.49
2,150.00	120.63	67.63	66.50	77.56	13.18	-9.74
3,150.00	28.68	-18.28	-11.42	4.21	-33.92	-52.28
4,150.00	20.91	-25.77	-17.94	-2.32	-40.44	-58.39
6,150.00	2.19	-44.92	-38.61	-22.98	-61.11	-79.70
6,500.00	-1.98	-49.09	-42.76	-27.13	-65.26	-83.80

Unique Supporting table - 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	500	1,200	2,400	3,600	5,500
10	0.06	0.64	0.78	0.39	0.39
20	0.09	0.11	0.29	0.14	0.14
30	0.00	0.04	0.26	0.13	0.13
40	0.00	0.00	0.08	0.04	0.04
60	0.00	-0.21	0.10	0.05	0.05

Unique Supporting table - 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	500	1,200	2,400	3,600	5,500
10	-0.43	-0.40	-0.40	-0.50	-0.50
20	-0.53	-0.50	-0.58	-0.50	-0.50
30	-0.67	-0.59	-0.55	-0.50	-0.50
40	-0.73	-0.61	-0.56	-0.50	-0.50
60	-0.80	-0.55	-0.56	-0.50	-0.50

Unique Supporting table - 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	1,000	2,000	2,500	3,000	4,000	5,000	6,000	7,000
6	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
8	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
10	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
18	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
24	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
30	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
40	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
60	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
77	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83

Unique Supporting table - 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	600	1,200	1,800	2,000	3,000	3,500	4,500	5,500	6,500
6	0.75	0.34	0.56	0.42	0.48	0.75	0.75	0.75	0.75
8	0.75	0.34	0.56	0.42	0.48	0.75	0.64	0.75	0.75
10	0.75	0.34	0.55	0.44	0.48	0.63	0.75	0.75	0.75
18	0.47	0.51	0.40	0.47	0.45	0.60	0.38	0.73	0.75
24	0.52	0.50	0.37	0.46	0.58	0.60	0.41	0.62	0.58
30	0.41	0.45	0.42	0.41	0.53	0.60	0.50	0.53	0.64
40	0.49	0.36	0.42	0.44	0.51	0.53	0.50	0.50	0.53
60	0.62	0.47	0.45	0.44	0.38	0.50	0.58	0.46	0.72
77	0.62	0.58	0.48	0.44	0.30	0.54	0.75	0.43	0.54

Unique Supporting table - 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	600	1,200	1,800	2,000	3,000	3,500	4,500	5,500	6,500
6	0.87	0.73	1.00	0.91	0.97	1.06	0.85	0.80	1.17
8	1.00	0.73	1.00	0.91	0.97	0.94	0.58	0.80	1.17
10	1.00	0.73	1.00	0.87	0.97	0.91	0.88	0.88	1.17
18	0.72	1.00	0.97	1.00	1.00	1.31	0.82	2.00	2.00
24	0.96	1.00	0.92	0.99	1.00	1.21	1.12	2.00	1.30
30	1.00	1.00	0.97	0.93	1.00	1.26	1.14	1.70	2.00
40	1.00	0.90	0.90	0.93	1.00	1.17	1.13	1.50	1.46
60	1.00	0.87	1.01	0.89	0.91	1.11	1.13	1.17	1.56
77	1.00	0.86	0.95	0.86	0.78	1.20	1.77	0.97	1.15

Unique Supporting table - 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	600	1,200	1,800	2,000	3,000	3,500	4,500	5,500	6,500
6	0.97	1.65	1.95	1.23	1.65	0.92	1.17	0.80	1.08
8	0.96	0.46	0.59	0.64	0.55	1.22	1.27	0.80	1.08
10	0.87	0.53	0.60	0.74	0.52	1.20	1.40	0.88	1.08
18	0.96	0.85	0.60	0.67	0.74	0.67	0.76	1.09	1.08
24	0.74	0.99	0.73	0.72	0.71	0.75	1.09	0.92	1.08
30	0.73	1.00	0.69	0.68	0.68	0.76	1.08	0.94	1.18
40	0.98	0.64	0.75	0.80	0.75	0.77	0.78	1.00	0.93
60	0.70	0.79	0.78	0.89	0.84	0.77	0.92	0.92	0.83
77	0.70	0.79	0.83	0.90	0.83	0.80	1.00	0.90	0.50

Unique Supporting table - 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	600	1,200	1,800	2,000	3,000	3,500	4,500	5,500	6,500
6	0	-1	0	0	-1	1	0	0	0
8	0	0	0	0	0	0	0	0	0
10	0	-1	-1	0	0	0	0	0	0
18	0	-1	-1	-1	-1	-1	-1	-1	-1
24	0	-1	0	-1	0	-1	-1	-1	0
30	0	-1	-1	-1	-1	0	-1	-1	-1
40	0	-1	-1	-1	-1	0	-1	-1	-1
60	0	-1	-1	0	0	0	0	0	0
77	0	0	-1	0	0	0	0	0	0

Unique Supporting table - 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	400	1,000	2,000	2,500	3,000	4,000	5,000	6,000	7,000
5	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1
50	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1
80	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1

Unique Supporting table - CylModeDecel

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

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

CylModeDecel - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	7,137	3,300	1,894	1,216	806	573	444	320	257	158	99	77	58
6	7,254	3,300	1,894	1,216	806	573	444	320	257	158	99	77	58
8	7,371	3,200	1,894	1,216	806	573	444	320	257	158	99	77	58
10	7,488	3,201	1,894	1,216	806	573	444	320	257	158	108	80	55
12	7,605	3,900	2,617	1,423	931	573	447	392	300	200	136	100	67
14	7,722	4,680	2,800	1,550	1,138	675	494	392	300	213	140	115	75
16	7,839	4,752	2,916	1,733	1,200	740	555	394	300	220	145	115	75
18	7,956	4,824	3,148	1,920	1,338	951	644	460	320	232	153	118	80
20	8,073	4,896	3,265	2,105	1,458	1,031	788	519	338	248	165	120	85
22	8,190	4,968	3,638	2,149	1,748	1,150	836	663	433	267	187	130	100
24	8,307	5,040	3,898	2,398	1,900	1,210	966	761	451	291	186	142	105
26	8,424	5,112	4,415	2,750	2,000	1,300	1,050	768	550	328	215	150	109
30	8,541	5,184	5,000	3,100	2,279	1,375	1,175	823	650	376	265	187	133
40	8,658	5,256	5,500	3,400	2,700	1,450	1,300	890	800	642	390	261	171
60	8,775	5,328	5,600	3,500	2,800	1,575	1,570	960	1,060	830	460	402	274
78	8,805	5,346	5,625	3,525	2,825	1,625	1,610	1,005	1,090	860	525	430	342
97	8,810	5,350	5,630	3,530	2,830	1,630	1,615	1,010	1,095	865	530	435	347

CylModeDecel - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
3	43	35	27	21	20	24	14	12	10	10	8	6	6
6	43	35	27	21	20	24	14	12	10	10	8	6	6
8	43	35	27	21	20	18	14	11	10	10	8	6	6
10	44	36	27	22	20	12	14	8	8	8	7	6	6
12	56	44	27	22	21	12	14	8	7	8	7	6	6
14	57	44	32	25	23	13	9	8	6	6	7	7	7
16	57	44	32	24	23	14	11	9	7	6	7	6	6
18	60	47	33	27	23	15	11	11	7	6	6	6	6
20	64	50	38	30	24	16	12	10	7	6	6	6	6
22	67	53	43	32	26	18	13	10	8	6	6	5	5
24	70	58	48	38	30	19	14	11	8	7	6	6	6
26	80	61	50	40	34	20	15	12	10	7	7	6	6
30	100	76	60	47	39	24	18	13	11	9	7	6	6

Unique Supporting table - CylModeDecel

40	130	102	78	63	54	33	25	17	13	10	10	8	8
60	200	150	120	104	89	55	40	25	20	13	12	9	9
78	281	200	167	140	128	64	50	24	22	20	14	14	14
97	286	205	172	145	135	69	55	29	23	22	18	18	18

Unique Supporting table - CylModeJerk

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

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

CylModeJerk - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	6,669	3,300	1,844	1,198	709	573	365	297	197	140	78	58	49
6	6,786	3,300	1,844	1,198	709	573	365	297	197	140	78	58	49
8	6,903	3,200	1,844	1,198	709	573	365	297	197	140	78	58	49
10	7,020	3,283	1,844	1,198	709	573	365	297	198	140	90	64	51
12	7,137	3,900	2,653	1,378	814	573	421	376	290	177	132	89	66
14	7,254	4,392	2,883	1,369	1,044	778	459	360	266	199	133	100	66
16	7,371	4,464	2,913	1,621	1,113	800	554	368	275	200	134	100	68
18	7,488	4,536	3,162	1,847	1,242	899	575	382	295	201	135	102	74
20	7,605	4,608	3,147	2,025	1,375	947	615	458	326	220	137	110	80
22	7,722	4,680	3,545	2,192	1,634	1,041	813	523	370	237	168	112	93
24	7,839	4,752	4,343	2,416	1,647	1,127	834	589	415	269	183	131	100
26	7,956	4,824	5,000	2,850	1,838	1,222	918	641	455	290	206	139	110
30	8,073	4,896	5,000	3,300	2,500	1,425	1,097	842	561	328	246	169	128
40	8,190	4,968	5,500	3,600	2,700	1,500	1,300	890	861	553	358	252	178
60	8,307	5,040	5,600	3,700	2,800	1,575	1,635	960	1,010	700	515	374	285
78	8,337	5,058	5,625	3,725	2,825	1,625	1,665	1,005	1,050	735	540	420	344
97	8,342	5,062	5,630	3,730	2,830	1,630	1,670	1,010	1,055	740	545	425	349

CylModeJerk - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
3	38	29	23	17	16	18	14	13	10	10	8	6	7
6	38	29	23	17	16	18	14	13	10	10	8	6	7
8	38	29	23	17	16	18	14	12	10	10	8	6	7
10	39	31	25	17	16	11	14	8	7	8	7	6	7
12	53	44	26	18	19	9	14	5	5	8	7	6	7
14	55	42	28	23	22	11	6	5	4	6	7	7	7
16	55	43	29	23	22	12	8	7	4	4	7	6	6
18	58	46	30	23	22	13	9	9	5	3	6	4	4
20	63	48	36	27	23	14	10	9	5	3	3	4	5
22	68	52	39	30	25	16	10	9	5	4	3	4	4
24	72	57	48	37	28	18	11	9	5	4	4	5	5
26	85	61	51	40	32	18	13	9	6	6	5	4	5
30	100	75	60	45	36	22	16	11	7	5	4	4	4

Unique Supporting table - CylModeJerk

40	135	96	75	59	48	31	23	14	10	7	7	7	7
60	210	160	118	96	80	50	36	24	18	12	12	9	9
78	291	220	158	133	117	59	50	20	22	18	14	13	13
97	296	225	163	138	124	63	55	25	24	22	14	17	17

Unique Supporting table - EngineOverSpeedLimit

Description: Engine OverSpeed Limit versus gear

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

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	6,900	7,150	7,150	7,150	7,150	7,150	7,150

EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	7,150	3,200	7,150	3,200	6,300	6,300	

Unique Supporting table - 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	4,897	3,498	2,008	1,289	855	608	470	339	278	170	107	83	62
6	4,897	3,498	2,008	1,289	855	608	470	339	278	170	107	83	62
8	4,749	3,392	2,008	1,289	855	608	470	339	278	170	107	83	62
10	4,750	3,393	2,008	1,289	855	608	470	339	278	170	116	86	59
12	5,788	4,134	2,774	1,508	987	608	474	416	324	216	147	108	72
14	6,945	4,961	2,968	1,643	1,206	716	524	416	324	230	151	124	81
16	7,052	5,037	3,091	1,837	1,272	784	588	417	324	238	157	124	81
18	7,159	5,114	3,337	2,035	1,418	1,008	683	488	339	246	162	125	85
20	7,266	5,190	3,461	2,232	1,546	1,093	836	550	359	263	175	127	90
22	7,373	5,266	3,856	2,278	1,853	1,219	886	703	459	283	198	138	106
24	7,480	5,343	4,132	2,542	2,014	1,283	1,024	807	478	309	197	151	112
26	7,586	5,419	4,680	2,915	2,120	1,378	1,113	814	583	348	228	159	116
30	7,693	5,495	5,300	3,286	2,416	1,458	1,246	873	689	398	281	198	141
40	7,800	5,572	5,830	3,604	2,862	1,537	1,378	944	848	681	414	277	181
60	7,907	5,648	5,936	3,710	2,968	1,670	1,664	1,018	1,124	880	488	426	290
78	7,934	5,667	5,963	3,737	2,995	1,723	1,707	1,066	1,156	912	557	456	363
97	7,939	5,671	5,968	3,742	3,000	1,728	1,712	1,071	1,161	917	562	461	368

Unique Supporting table - 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	4,897	3,498	1,955	1,270	752	608	387	315	213	151	84	63	53
6	4,897	3,498	1,955	1,270	752	608	387	315	213	151	84	63	53
8	4,749	3,392	1,955	1,270	752	608	387	315	213	151	84	63	53
10	4,872	3,480	1,955	1,270	752	608	387	315	214	151	97	69	55
12	5,788	4,134	2,812	1,460	863	608	446	399	313	191	142	96	71
14	6,518	4,656	3,056	1,451	1,107	825	487	382	288	215	144	108	71
16	6,625	4,732	3,088	1,718	1,180	848	587	390	297	216	145	108	74
18	6,732	4,808	3,352	1,958	1,363	1,053	647	448	312	213	143	108	79
20	6,839	4,885	3,336	2,147	1,509	1,109	721	536	345	233	145	117	85
22	6,945	4,961	3,758	2,323	1,794	1,219	952	613	392	251	178	118	99
24	7,052	5,037	4,604	2,561	1,808	1,320	977	690	440	285	194	139	106
26	7,159	5,114	5,300	3,021	2,018	1,431	1,075	750	483	307	219	147	117
30	7,266	5,190	5,300	3,498	2,650	1,511	1,163	892	594	347	260	179	136
40	7,373	5,266	5,830	3,816	2,862	1,590	1,378	944	913	586	380	267	188
60	7,480	5,343	5,936	3,922	2,968	1,670	1,733	1,018	1,071	742	546	396	302
78	7,506	5,362	5,963	3,949	2,995	1,723	1,765	1,066	1,113	779	573	445	365
97	7,512	5,365	5,968	3,954	3,000	1,728	1,770	1,071	1,119	785	578	451	370

Unique Supporting table - 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	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
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

Unique Supporting table - 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	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
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

Unique 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	510.0	510.0	510.0	510.0	510.0	420.0	420.0	420.0	420.0

Unique 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	55	55	55	55	55
0.125	55	55	55	55	55
0.250	55	55	55	55	55
0.375	55	55	55	55	55
0.500	20	20	20	20	20
0.625	20	20	20	20	20
0.750	20	20	20	20	20
0.875	20	20	20	20	20
1.000	20	20	20	20	20

Unique 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

Unique 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	3	5	10	15	20	30
1	0	0	1	1	1	1	1	1	1

Unique 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	3	5	10	15	20	30

Unique 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	0	500	700	735	770	805	840	875	910	945	980	1,025	1,100	1,300	1,600	2,000	2,200
1	0	5	5	6	6	7	8	9	10	11	12	12	12	12	12	12	12

Unique 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	-15	-10	-5	-1	1	2	4	10	25
1	1.13	1.13	1.13	1.13	1.00	0.88	0.38	0.38	0.31

Unique 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	10.00	18.40	27.00	35.40	44.00
1.00	38.00	38.00	38.00	38.00	32.00

Unique 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	10.00	18.40	27.00	35.40	44.00
1.00	63.00	62.00	61.00	60.00	59.00

Unique 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	10.00	18.40	27.00	35.40	44.00
1.00	88.00	88.00	86.00	85.00	82.00

Unique 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	57.00	63.70	72.50	81.20	90.00
1.00	31.00	33.00	35.00	38.00	39.00

Unique 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	57.00	63.70	72.50	81.20	90.00
1.00	53.00	56.00	60.00	63.00	65.00

Unique 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	57.00	63.70	72.50	81.20	90.00
1.00	75.00	80.00	83.00	87.00	88.00

Unique 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	10.00	18.40	27.00	35.40	44.00
1.00	18.00	19.00	22.00	25.00	30.00

Unique 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	10.00	18.40	27.00	35.40	44.00
1.00	43.00	44.00	46.00	50.00	54.00

Unique 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	10.00	18.40	27.00	35.40	44.00
1.00	70.00	69.00	68.00	68.00	67.00

Unique 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	57.00	63.70	72.50	81.20	90.00
1.00	28.00	23.00	21.00	19.00	18.00

Unique 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	57.00	63.70	72.50	81.20	90.00
1.00	46.00	44.00	44.00	44.00	44.00

Unique 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	57.00	63.70	72.50	81.20	90.00
1.00	68.00	68.00	68.00	69.00	71.00

Unique 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	1.00	2.00	3.00	4.00	5.00
1.00	10.00	18.40	27.00	35.40	44.00

Unique 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	1.00	2.00	3.00	4.00	5.00
1.00	57.00	63.70	72.50	81.20	90.00

Unique 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	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96	0.96	1.00	1.00	0.00	0.00	0.00	0.00
240	0.00	0.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
280	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
320	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
360	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
400	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
440	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
480	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
520	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
560	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
640	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
680	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

Unique 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	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96	0.96	1.00	1.00	0.00	0.00	0.00	0.00
240	0.00	0.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
280	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
320	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
360	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
400	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
440	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
480	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
520	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
560	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
640	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
680	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

Unique Supporting table - P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)

Description: KtFWDD_Cnt_SampleWeigthting: Calibration table that defines the weighting factor used in a sample of the measured transfer case ratio for full range diagnostics, based on vehicle speed and axle torque.

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: KtFWDD_Cnt_SampleWeigthting

y/x	0.00	3.00	5.00	5.10	12.00	15.00	18.00	21.00	24.00
-200.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
-150.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
-100.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
-50.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
0.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
50.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
100.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
150.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
200.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249

Unique Supporting table - P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)

Description: LeFWDD_r_RatioHiBound_P279A = KeFWDD_r_TCaseHiRange + KtFWDD_r_TCaseHiRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound_P279A

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000
2.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000
3.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000
4.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000
5.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000
6.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000
7.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000
8.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000
9.00	8.9999	8.9999	8.9999	8.9999	1.3000	1.3000	1.3000	1.3000	1.3000

Unique Supporting table - P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)

Description: LeFWDD_r_RatioLoBound_P279A = KeFWDD_r_TCaseHiRange - KtFWDD_r_TCaseHiRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound_P279A

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000
2.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000
3.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000
4.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000
5.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000
6.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000
7.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000
8.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000
9.00	-6.9999	-6.9999	-6.9999	-6.9999	0.7000	0.7000	0.7000	0.7000	0.7000

Unique Supporting table - P279B Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)

Description: LeFWDD_r_RatioHiBound_P279B = KeFWDD_r_TCaseLoRange + KtFWDD_r_TCaseLoRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound_P279B

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100
2.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100
3.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100
4.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100
5.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100
6.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100
7.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100
8.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100
9.00	10.7098	10.7098	10.7098	10.7098	3.0100	3.0100	3.0100	3.0100	3.0100

Unique Supporting table - P279B Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)

Description: LeFWDD_r_RatioLoBound_P279B = KeFWDD_r_TCaseLoRange - KtFWDD_r_TCaseLoRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound_P279B

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099
2.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099
3.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099
4.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099
5.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099
6.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099
7.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099
8.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099
9.00	-5.2899	-5.2899	-5.2899	-5.2899	2.4099	2.4099	2.4099	2.4099	2.4099

Unique Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 1)

Description: LeFWDD_r_RatioHiBound1_P279C = KeFWDD_r_TCaseHiRange + KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound1_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	8.9999	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000
2.00	8.9999	8.9999	8.9999	8.9999	2.0000	2.0000	1.5000	1.5000	1.5000
3.00	8.9999	8.9999	8.9999	8.9999	3.0000	3.0000	2.0000	2.0000	2.0000
4.00	8.9999	8.9999	8.9999	8.9999	5.0000	5.0000	3.0000	3.0000	3.0000
5.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
6.00	8.9999	8.9999	8.9999	8.9999	5.0000	5.0000	3.0000	3.0000	3.0000
7.00	8.9999	8.9999	8.9999	8.9999	3.0000	3.0000	2.0000	2.0000	2.0000
8.00	8.9999	8.9999	8.9999	8.9999	2.0000	2.0000	1.5000	1.5000	1.5000
9.00	8.9999	8.9999	8.9999	8.9999	1.1000	1.1000	1.1000	1.1000	1.1000

Unique Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 2)

Description: LeFWDD_r_RatioHiBound2_P279C = KeFWDD_r_TCaseLoRange + KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound2_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	10.7098	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099
2.00	10.7098	10.7098	10.7098	10.7098	3.7100	3.7100	3.2100	3.2100	3.2100
3.00	10.7098	10.7098	10.7098	10.7098	4.7100	4.7100	3.7100	3.7100	3.7100
4.00	10.7098	10.7098	10.7098	10.7098	6.7100	6.7100	4.7100	4.7100	4.7100
5.00	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098
6.00	10.7098	10.7098	10.7098	10.7098	6.7100	6.7100	4.7100	4.7100	4.7100
7.00	10.7098	10.7098	10.7098	10.7098	4.7100	4.7100	3.7100	3.7100	3.7100
8.00	10.7098	10.7098	10.7098	10.7098	3.7100	3.7100	3.2100	3.2100	3.2100
9.00	10.7098	10.7098	10.7098	10.7098	2.8099	2.8099	2.8099	2.8099	2.8099

Unique Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 1)

Description: LeFWDD_r_RatioLoBound1_P279C = KeFWDD_r_TCaseHiRange - KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound1_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-6.9999	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000
2.00	-6.9999	-6.9999	-6.9999	-6.9999	0.0000	0.0000	0.5000	0.5000	0.5000
3.00	-6.9999	-6.9999	-6.9999	-6.9999	-1.0000	-1.0000	0.0000	0.0000	0.0000
4.00	-6.9999	-6.9999	-6.9999	-6.9999	-3.0000	-3.0000	-1.0000	-1.0000	-1.0000
5.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
6.00	-6.9999	-6.9999	-6.9999	-6.9999	-3.0000	-3.0000	-1.0000	-1.0000	-1.0000
7.00	-6.9999	-6.9999	-6.9999	-6.9999	-1.0000	-1.0000	0.0000	0.0000	0.0000
8.00	-6.9999	-6.9999	-6.9999	-6.9999	0.0000	0.0000	0.5000	0.5000	0.5000
9.00	-6.9999	-6.9999	-6.9999	-6.9999	0.9000	0.9000	0.9000	0.9000	0.9000

Unique Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 2)

Description: LeFWDD_r_RatioLoBound2_P279C = KeFWDD_r_TCaseLoRange - KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound2_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-5.2899	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100
2.00	-5.2899	-5.2899	-5.2899	-5.2899	1.7100	1.7100	2.2100	2.2100	2.2100
3.00	-5.2899	-5.2899	-5.2899	-5.2899	0.7100	0.7100	1.7100	1.7100	1.7100
4.00	-5.2899	-5.2899	-5.2899	-5.2899	-1.2900	-1.2900	0.7100	0.7100	0.7100
5.00	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899
6.00	-5.2899	-5.2899	-5.2899	-5.2899	-1.2900	-1.2900	0.7100	0.7100	0.7100
7.00	-5.2899	-5.2899	-5.2899	-5.2899	0.7100	0.7100	1.7100	1.7100	1.7100
8.00	-5.2899	-5.2899	-5.2899	-5.2899	1.7100	1.7100	2.2100	2.2100	2.2100
9.00	-5.2899	-5.2899	-5.2899	-5.2899	2.6100	2.6100	2.6100	2.6100	2.6100

Unique Supporting table - 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	600	1,200	1,800	2,000	3,000	3,500	4,500	5,500	6,500
6	1.00	0.47	0.66	0.62	0.48	1.00	0.90	0.85	0.94
8	1.00	0.32	0.44	0.49	0.40	0.86	0.73	0.80	0.94
10	0.91	0.42	0.52	0.59	0.55	0.61	0.60	0.83	1.00
18	0.75	0.75	0.71	0.85	0.77	0.77	0.52	1.00	1.00
24	0.73	0.82	0.68	0.84	0.74	0.70	0.58	0.58	0.69
30	0.77	0.67	0.75	0.81	0.72	0.67	0.58	0.58	0.69
40	0.80	0.56	0.78	0.80	0.73	0.64	0.62	0.58	0.58
60	0.80	0.71	0.77	0.85	0.70	0.65	0.60	0.60	0.67
77	0.81	0.73	0.81	0.81	0.70	0.81	0.73	0.64	0.46

Unique Supporting table - 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	600	1,200	1,800	2,000	3,000	3,500	4,500	5,500	6,500
6	1.00	0.61	0.78	0.59	0.52	1.04	0.85	0.85	0.94
8	1.00	0.67	0.84	0.79	0.58	0.82	0.75	0.80	0.94
10	1.00	0.78	0.76	0.77	0.65	0.64	0.64	0.94	1.00
18	0.85	0.96	1.01	1.10	0.84	0.96	0.88	1.18	1.42
24	0.84	1.19	0.96	1.10	0.98	0.94	1.00	1.18	1.10
30	1.07	1.07	1.09	1.05	1.03	1.00	1.00	1.14	1.10
40	1.33	0.84	1.09	1.07	1.11	0.96	0.96	1.00	1.00
60	1.28	0.87	1.19	1.15	1.04	1.01	0.89	0.87	0.87
77	1.29	0.88	1.14	1.10	0.97	1.13	0.93	0.81	0.62

Unique Supporting table - 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	600	1,200	1,800	2,000	3,000	3,500	4,500	5,500	6,500
6	1.00	1.00	1.00	1.00	1.00	1.00	1.20	1.00	1.17
8	1.00	1.00	1.00	1.00	1.00	1.06	1.20	1.00	1.17
10	1.00	1.00	1.00	1.00	1.20	1.20	1.20	1.00	1.00
18	1.09	1.09	1.06	1.09	1.20	1.20	1.00	1.09	1.00
24	1.05	1.09	1.09	1.09	1.20	1.20	1.09	1.15	1.00
30	1.20	1.12	1.09	1.09	1.20	1.20	1.15	1.18	1.00
40	1.07	1.06	1.09	1.09	1.20	1.20	1.17	1.15	1.00
60	1.15	1.14	1.03	1.09	1.17	1.09	1.20	1.20	1.00
77	1.13	1.14	1.20	1.09	1.00	1.07	1.20	1.20	1.00

Unique Supporting table - 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	600	1,200	1,800	2,000	3,000	3,500	4,500	5,500	6,500
6	1.00	1.00	1.00	1.00	1.00	1.20	1.20	1.00	1.17
8	1.00	1.00	1.00	1.00	1.00	1.00	1.20	1.00	1.17
10	1.00	1.00	1.00	1.00	1.20	1.09	1.20	1.00	1.00
18	1.02	1.09	1.06	1.06	1.20	1.08	1.00	1.00	1.00
24	1.00	1.00	1.06	1.04	1.10	1.16	1.00	1.00	1.00
30	1.09	1.00	1.05	1.01	1.09	1.11	1.00	1.00	1.00
40	1.00	1.00	1.02	1.00	1.07	1.08	1.00	1.00	1.00
60	1.00	1.14	1.00	1.02	1.08	1.00	1.00	1.04	1.00
77	1.00	1.14	1.00	1.00	1.00	1.00	1.20	1.00	1.00

Unique Supporting table - 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	500	1,000	1,200	2,000	3,000	3,500	4,500	5,500	6,500
1	1.06	1.06	1.20	2.41	2.44	2.40	2.42	2.42	2.42

Unique Supporting table - 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	500	1,000	1,200	2,000	3,000	3,500	4,500	5,500	6,500
1	2.90	2.20	1.94	0.94	0.83	0.84	0.84	0.84	0.84
1	2.20	1.70	1.55	1.30	0.89	0.95	0.92	0.92	0.92
1	1.40	1.30	1.71	0.82	0.90	0.90	1.10	1.10	1.10
2	1.40	1.10	1.42	0.98	1.10	1.10	1.10	1.81	1.80
2	1.40	1.22	1.19	1.29	1.10	1.11	1.02	1.21	4.00
5	1.40	1.02	1.68	1.63	1.05	1.10	1.46	2.32	4.00
8	1.40	1.02	1.68	1.63	1.05	1.10	1.46	2.32	4.00
8	1.40	1.02	1.68	1.63	1.05	1.10	1.46	2.32	4.00
8	1.40	1.02	1.68	1.63	1.05	1.10	1.46	2.32	4.00

Unique Supporting table - ZeroTorqueAFM

Description: Zero torque engine load while in Active Fuel Management. %of Max Brake Torque along the Neutral rev line, as a function of RPM and Baro

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

ZeroTorqueAFM - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	0.00	-1.20	-1.80	-2.20	-2.20	-1.80	-1.20	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00

ZeroTorqueAFM - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	-1.25	-1.50	-1.70	-1.50	-1.00	0.81	2.62	4.44	6.25	8.06	9.88	11.69	13.50

Unique Supporting table - ZeroTorqueEngLoad

Description: %of Max Brake Torque that represents Zero Brake torque along the Neutral rev line, as a function of RPM and Baro

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

ZeroTorqueEngLoad - Part 1

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
1	0.00	-1.20	-1.80	-2.20	-2.20	-1.80	-1.20	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00

ZeroTorqueEngLoad - Part 2

y/x	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
1	-1.25	-1.50	-1.70	-1.50	-1.00	0.81	2.62	4.44	6.25	8.06	9.88	11.69	13.50

Unique 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	256

Unique 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	600.0	600.0	600.0	480.0	400.0	200.0	200.0	200.0	40.0	40.0	40.0	40.0	40.0	20.0	20.0	20.0	20.0

Unique 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	50.0	50.0	50.0	45.0	40.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Unique 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	405.0	405.0	380.0	380.0	380.0	85.0	85.0	75.0	75.0	75.0	75.0	25.0	25.0	25.0	25.0	25.0	25.0

Unique 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	600.0	600.0	600.0	480.0	380.0	85.0	85.0	85.0	85.0	85.0	85.0	25.0	25.0	25.0	25.0	25.0	25.0

Unique 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	15	15	15	15	30	56	105	180	340	500	500	500	500	500	500	500	500

Unique 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	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
2	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
3	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
4	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
5	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
6	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
7	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
8	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
9	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
10	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
11	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
12	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
13	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
14	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
15	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
16	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9
17	-292.1	-292.1	-292.1	-292.1	-291.7	-288.7	-284.1	-277.3	-266.8	-252.5	-235.2	-216.7	-198.0	-179.8	-162.7	-147.9	-147.9

Unique Supporting table - P0442 Estimate of Ambient Temperature Valid Conditioning Time as a Function of Ign Off Time Table

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

Notes: KtOATC_t_EstIdleCondTimePreset

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

y/x	0	600	1,200	1,800	2,400	3,000	3,600	4,200	4,800	5,400	6,000	6,600	7,200	7,800	8,400	9,000	9,600
1	200	300	300	400	400	350	350	350	300	300	250	250	250	250	250	250	250

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

y/x	10,200	10,800	11,700	12,600	13,500	14,400	15,300	16,200	17,100	18,000	19,200	20,400	21,600	22,800	24,000	25,200	
1	200	200	200	200	200	200	200	200	200	200	200	200	200	175	175	175	

Unique 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	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

Unique 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	550	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	10.9121	10.8086	10.8105	10.7129	10.4766	10.4766	10.4609	10.4785	10.4551	10.1074	9.4414	8.7832	8.2520	8.2520	8.2520	8.2520	8.2520

Unique 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	550	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	3.8770	3.6582	3.6641	3.6133	3.5078	3.5098	3.5313	3.5645	3.5762	3.4648	3.5059	3.4277	3.3750	3.3750	3.3750	3.3750	3.3750

Unique Supporting table - P0326_P0331_AbnormalNoise_CylsEnabled

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

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

Unique Supporting table - 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	0.229	0.215	0.212	0.212	0.200	0.211	0.250	0.258	0.282	0.270	0.271	0.203	0.157	0.157	0.157	0.157	0.157

Unique Supporting table - P0531_Coolant_Weighting_Factor

Description: Coolant Weighting Factor for Delta Predicted AC Pressure

Notes: For P0531: KtACCD_k_HSPRat_EngageCoolCoeff with X Axis is Engine Coolant defined by KnACCD_T_HSPRat_EngageTstCool to weight the Delta Predicted Pressure

y/x	-40	-20	0	20	40	60	80	100	120
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8999	0.7500	0.5000

Unique Supporting table - P0531_Delta_Predicted_ Pressure

Description: AC High Side Pressure Sensor Sensor Engage Test Predicted Delta Pressure

Notes: For P0531: KtACCD_p_HSPR_DeltaPredicted with X Axis is defined by KnACCD_T_HSPRat_EngageTstAmb and Y Axis is defined by KnACCD_v_HSPRat_EngageTstVehSpd

y/x	0	20	30	40	50	60	70	80	100
0	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00
20	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00
40	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00
60	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00
80	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00
100	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00
120	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00
140	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00
160	40.00	50.00	60.00	70.00	75.00	80.00	100.00	100.00	100.00

Unique Supporting table - P0531_Delta_Predicted_Quality_Factor

Description: Delta Predicted Qualtiy Factor for the Engage Test

Notes: For P0531: KtACCD_k_HSPR_QualFactor with X Axis is defined by KnACCD_T_HSPRat_EngageTstAmb and Y Axis is defined by KnACCD_v_HSPRat_EngageTstVehSpd

y/x	0	20	30	40	50	60	70	80	100
0	0.05000	0.25999	0.42999	0.46001	0.53000	0.63000	0.72000	0.84000	0.99001
20	0.05000	0.24001	0.38000	0.42999	0.49001	0.58000	0.67000	0.81000	0.99001
40	0.05000	0.16000	0.28000	0.31000	0.39000	0.50999	0.62000	0.75999	0.95000
60	0.05000	0.14999	0.25999	0.28999	0.35001	0.44000	0.53999	0.69000	0.92999
80	0.05000	0.14000	0.25000	0.28000	0.34000	0.41000	0.49001	0.63000	0.88000
100	0.05000	0.12000	0.23000	0.25999	0.31000	0.38000	0.46001	0.58000	0.78000
120	0.05000	0.10001	0.20000	0.25000	0.30000	0.33000	0.39999	0.52000	0.73000
140	0.05000	0.09000	0.17999	0.22000	0.25000	0.28000	0.35001	0.39999	0.48000
160	0.05000	0.08000	0.17999	0.19000	0.21001	0.23000	0.28000	0.33000	0.41000

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

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

Notes: P0606, KaPISD_b_ProgSeqWatchEnbl

y/x	CeTSKR_e_CPU	CeTSKR_e_CPU2
CePISR_e_6p25msSeq	1	0
CePISR_e_12p5msSeq	1	0
CePISR_e_25msSeq	1	0
CePISR_e_LORES_C	1	0

Unique 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	550	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	0.281	0.275	0.279	0.303	0.355	0.422	0.602	0.656	0.756	0.980	1.150	1.859	1.859	1.859	1.859	1.859	1.859

Unique 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	550	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	0.131	0.129	0.131	0.146	0.178	0.215	0.320	0.352	0.412	0.543	0.641	1.041	1.041	1.041	1.041	1.041	1.041

Unique Supporting table - P156A_Off_Test_Threshold

Description: AC High Side Pressure Sensor Rationality Off Test Threshold

Notes: For P156A: KtACCD_p_HSPRat_OffTestPresMax with X Axis is defined by KnACCD_T_HSPRat_OffTestPresMax

y/x	0	20	40	60	100
1	1,000	1,400	1,800	2,000	2,300

Unique Supporting table - P156B_On_Test_Threshold

Description: AC High Side Pressure Sensor Rationality On Test Threshold

Notes: For P156B: KtACCD_p_HSPRat_OnTestPresMin with X Axis is defined by KnACCD_T_HSPRat_OnTestPresMin

y/x	0	20	40	60	100
1	65.0	195.0	260.0	325.0	455.0

Unique Supporting table - P156C_Cold_Test_Threshold

Description: AC High Side Pressure Sensor Rationality Cold Test Threshold

Notes: For P156C: KtACCD_p_HSPRat_ColdTestTarget with X Axis is defined by KnACCD_T_HSPRat_ColdTestTarget

y/x	-20	0	20	60	100
1	150	250	600	1,300	1,500

Unique Supporting table - DFCO_CoolEnblHi_Temp

Description:

Notes:

y/x	-40	0	25
1	25.0	60.0	60.0

Unique Supporting table - DFCO_DelayAfterStart_Time

Description:

Notes:

y/x	-30	-10	20	60	90
1	30.0	30.0	30.0	15.0	10.0

Unique Supporting table - DFCO_DsblLo_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	25	25
CeTGRR_e_TransGr2	34	34
CeTGRR_e_TransGr3	34	34
CeTGRR_e_TransGr4	0	0
CeTGRR_e_TransGr5	0	0
CeTGRR_e_TransGr6	0	0
CeTGRR_e_TransGrEVT1	38	38
CeTGRR_e_TransGrEVT2	38	38
CeTGRR_e_TransGrNeut	0	0
CeTGRR_e_TransGrRvrs	2	2
CeTGRR_e_TransGrPark	0	0
CeTGRR_e_TransGr7	0	0
CeTGRR_e_TransGr8	0	0

Unique Supporting table - DFCO_EnblHi_Vehicle_Speed

Description:

Notes:

y/x	CeTCOR_e_NonEcoMode	CeTCOR_e_EcoMode
CeTGRR_e_TransGr1	27.0	27.0
CeTGRR_e_TransGr2	36.0	36.0
CeTGRR_e_TransGr3	36.0	36.0
CeTGRR_e_TransGr4	0.0	0.0
CeTGRR_e_TransGr5	0.0	0.0
CeTGRR_e_TransGr6	0.0	0.0
CeTGRR_e_TransGrEVT1	40.0	40.0
CeTGRR_e_TransGrEVT2	40.0	40.0
CeTGRR_e_TransGrNeut	255.0	255.0
CeTGRR_e_TransGrRvrs	5.0	5.0
CeTGRR_e_TransGrPark	255.0	255.0
CeTGRR_e_TransGr7	0.0	0.0
CeTGRR_e_TransGr8	0.0	0.0

Bundle Name: 5VoltReferenceB_FA
P0651
Bundle Name: 5VoltReferenceMAP_OOR_Flt
P0697
Bundle Name: A/F Imbalance Bank1
P219A
Bundle Name: AAP_SnsrCktFA
Naturally aspirated: P2228, P2229. Turbocharged: P0237, P0238
Bundle Name: AAP_SnsrCktFP
Naturally aspirated: P2228, P2229. Turbocharged: P0237, P0238
Bundle Name: AAP_SnsrFA
Naturally Aspirated: P2227, P2228, P2229, P2230. Turbocharged: P0237, P0238.
Bundle Name: AAP2_SnsrCktFA
P2228, P2229
Bundle Name: AAP2_SnsrCktFP
P2228, P2229
Bundle Name: AAP2_SnsrFA
P2227, P2228, P2229, P2230
Bundle Name: AAP3_SnsrCktFA
P222C, P222D
Bundle Name: AAP3_SnsrCktFP
P222C, P222D
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: AfterThrottlePressureFA
Naturally Aspirated or Turbocharged: P0106, P0107, P0108. Supercharged: P012B, P012C, P012D.
Bundle Name: AIR System FA
P0411, P2440, P2444
Bundle Name: AmbientAirDefault
Baro Sensor Present: P2227, P2228, P2229, P2230. No Baro Sensor Present: P0101, P0102, P0103, P0106, P0107, P0108, P0111, P0112, P0113, P0114, P0121, P0122, P0123,

P012B, P012C, P012D, P0222, P0223, P1221
Bundle Name: AmbPresDfltdStatus
Baro Sensor Present: P2227, P2228, P2229, P2230. No Baro Sensor Present: P0101, P0102, P0103, P0106, P0107, P0108, P0111, P0112, P0113, P0114, P0121, P0122, P0123, P012B, P012C, P012D, P0222, P0223, P1221
Bundle Name: AmbPresSnsr2_CktFA
P222C, P222D
Bundle Name: AmbPresSnsrCktFA
P2228, P2229
Bundle Name: AnyCamPhaser_FA
P0010, P0011, P0013, P0014, P0020, P0021, P0023, P0024, P2088, P2089, P2090, P2091, P2092, P2093, P2094, P2095, P05CC, P05CD, P05CE, P05CF,
Bundle Name: AnyCamPhaser_TFTKO
P0010, P0011, P0013, P0014, P0020, P0021, P0023, P0024, P2088, P2089, P2090, P2091, P2092, P2093, P2094, P2095, P05CC, P05CD, P05CE, P05CF,
Bundle Name: BrakeBoosterVacuumValid
P0556, P0557, P0558
Bundle Name: BSTR_b_BoostSnsrFA
P0236, P0237, P0238
Bundle Name: BSTR_b_PCA_CktFA
P0033, P0034, P0035, P0045, P0047, P0048, P0243, P0245, P0246, P0247, P0249, P0250
Bundle Name: BSTR_b_PCA_TFTKO
P0234, P0299, P0033, P0034, P0035, P0045, P0047, P0048, P0243, P0245, P0246, P2261, P0247, P0249, P0250
Bundle Name: BSTR_b_TurboBypassCktFA
P0033, P0034, P0035, P00C0, P00C1, P00C2
Bundle Name: CamLctnExhFA
P0017, P0019, P0365, P0366, P0390, P0391
Bundle Name: CamLctnIntFA
P0016, P0018, P0340, P0341, P0345, P0346
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: CamSnsrExhTFTKO
P0017, P0019, P0365, P0366, P0390, P0391
Bundle Name: CamSnsrIntTFTKO
P0016, P0018, P0340, P0341, P0345, P0346
Bundle Name: Catalyst Warmup Enabled

N/A

Catalyst Warmup Enabled - Other Definitions:
To enable the Cold Start Emission Reduction Strategy:

Catalyst Temperature < 350.00 degC
AND
Engine Coolant > -10.00 degC
AND
Engine Coolant <= 56.00 degC
AND
Barometric Pressure>= 74.00 KPa
AND

DTC's Not Set:

ECT_Sensor_FA
MAP_SensorFA

The Cold Start Emission Reduction Strategy will remain active until:

Engine Run Time > **P050D_P1400_CatalystLightOffExtendedEngineRunTimeExit** This Extended Engine run time exit is a function of percent ethanol and Catmons NormRatioEWMA. Refer to "Supporting Tables" for details.

OR

Catalyst Temperature >= 900.00 degC
AND
Engine Run Time >= 18.38 seconds

OR

Barometric Pressure < 74.00 KPa

Bundle Name: ClutchPstnSnsr FA

P0806, P0807, P0808

Bundle Name: ClutchPstnSnsrCktHi FA

P0808

Bundle Name: ClutchPstnSnsrCktLo FA

P0807

Bundle Name: ClutchPstnSnsrNotLearned

P080A

Bundle Name: CrankSensor_FA

P0335, P0336

Bundle Name: CrankSensor_TFTKO

P0335, P0336

Bundle Name: CylDeacAllDriverFault
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: 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: ECT_Sensor_Ckt_FA
P0117, P0118
Bundle Name: ECT_Sensor_Ckt_FP
P0117, P0118
Bundle Name: ECT_Sensor_Ckt_TFTKO
P0117, P0118
Bundle Name: ECT_Sensor_DefaultDetected
P0116, P0117, P0118, P0119, P111E
Bundle Name: ECT_Sensor_FA
P0116, P0117, P0118, P0119, P0128, P111E
Bundle Name: ECT_Sensor_Perf_FA
P0116, P111E
Bundle Name: EGRValve_FP
P0405, P0406, P042E
Bundle Name: EGRValveCircuit_FA
P0403, P0404, P0405, P0406, P0489, P0490, P042E, P1426, P1437
Bundle Name: EGRValvePerformance_FA
P0404, P042E, P0401
Bundle Name: EngineMisfireDetected_FA
P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308
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, P06D2, P06DE, P0A1D, P1104, P127A, P127C, P127D, P15F2, P160D, P160E, P1682, P16A0, P16A1, P16A2, P16A7, 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, EGRValvePerformance_FA, P16F3
EngineTorqueEstInaccurate - Other Definitions: P16F3 with GetXOYR_b_SecurityFlt (CeXOYR_e_MAPR_AfterThrotPresFlt, CeXOYR_e_MAPR_EngineVacuumFlt, CeXOYR_e_MAPR_IntkMnfdPresFlt, CeXOYR_e_MAFR_Ahead1vs2FinalFlt)
Bundle Name: 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: EvapSmallLeak_FA
P0442
Bundle Name: EvapVentSolenoidCircuit_FA
P0449, P0498, P0499
Bundle Name: FHPR_b_FRP_SnsrCkt_FA
P0192, P0193, P127C, P127D, P16E4, P16E5, P128A, P128B, 128F
Bundle Name: FHPR_b_FRP_SnsrCkt_TFTKO
P0192, P0193, , P127C, P127D, P16E4, P16E5, P128A, P128B, 128F
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: 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: FuelPumpRlyCktFA
P0627, P0628, P0629
Bundle Name: FuelTankPressureSnsrCkt_FA
P0452, P0453
Bundle Name: FuelTrimSystemB1_FA
P0171, P0172, P11E9 , P11EA

Bundle Name: FuelTrimSystemB2_FA
P0174, P0175, P11EB, P11EC
Bundle Name: HumTempSnsrCktFA
P0097, P0098
Bundle Name: IAC_SystemRPM_FA
P0506, P0507
Bundle Name: IAT_SensorCircuitFA
P0112, P0113
Bundle Name: IAT_SensorCircuitFP
P0112, P0113
Bundle Name: IAT_SensorFA
P0111, P0112, P0113, P0114
Bundle Name: IAT_SensorTFTKO
P0111, P0112, P0113, P0114
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: MAF_SensorCircuitFA
P0102, P0103, P010C, P010D
Bundle Name: MAF_SensorFA
P0101, P0102, P0103, P010B, P010C, P010D
Bundle Name: MAF_SensorTFTKO
P0101, P0102, P0103, P010B, P010C, P010D
Bundle Name: MAF_Snsr1_FA
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_SensorTFTKO

P0106, P0107, P0108
Bundle Name: MnfdTempSensorCktFA
Turbocharged or Supercharged, with Humidity sensor: P00EA, P00EB. Turbocharged or Supercharged, without Humidity sensor: P0097, P0098. Naturally Aspirated: P0112, P0113.
Bundle Name: MnfdTempSensorCktFP
Turbocharged or Supercharged, with Humidity sensor: P00EA, P00EB. Turbocharged or Supercharged, without Humidity sensor: P0097, P0098. Naturally Aspirated: P0112, P0113.
Bundle Name: MnfdTempSensorFA
Turbocharged or Supercharged, with Humidity sensor: P00E9, P00EA, P00EB, P00EC. Turbocharged or Supercharged, without Humidity sensor: P0096, P0097, P0098, P0099. Naturally Aspirated: P0111, P0112, P0113, P0114.
Bundle Name: O2S_Bank_1_Sensor_1_FA
P2A00, P0131, P0132, P0133, P0134, P0135, P0053, P1133, P015A, P015B, P0030
Bundle Name: O2S_Bank_1_Sensor_2_FA
P013A, P013B, P013E, P013F, P2270, P2271, P0137, P0138, P0140, P0141, P0054, P0036
Bundle Name: O2S_Bank_2_Sensor_1_FA
P2A03, P0151, P0152, P0153, P0154, P0155, P0059, P1153, P015C, P015D, P0050
Bundle Name: O2S_Bank_2_Sensor_2_FA
P013C, P013D, P014A, P014B, P2272, P2273, P0157, P0158, P0160, P0161, P0060, P0056
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: OilPmpStuckHigh
P06DA, P06DB, P06DD
OilPmpStuckHigh - Other Definitions: TFTKO and FA
Bundle Name: PowertrainRelayFault
P1682, P16A7, P16BC
Bundle Name: PowertrainRelayStateOn_FA
P0685, P0686, P0687
Bundle Name: TC_BoostPresSnsrCktFA
P0237, P0238
Bundle Name: TC_BoostPresSnsrFA
P0236, P0237, P0238
Bundle Name: THMR_AHV_FA
P2681, P26A3, P26A6, P26A7, P26A9
THMR_AHV_FA - Other Definitions:
Bundle Name: THMR_AWP_AuxPumpFA
B269A, B269C, B269D
Bundle Name: THMR_SWP_Control_FA

P261A, P261D, P261C
Bundle Name: THMR_SWP_FlowStuckOn_FA
P261A, P261D, P261E
Bundle Name: THMR_SWP_NoFlow_FA
P261B, P261C
Bundle Name: TPS_FA
P0122, P0123, P0222, P0223, P16A0, P16A1, P16A2, P2135
Bundle Name: TPS_Performance_FA
P0068, P0121, P1104, P2100, P2101, P2102, P2103
Bundle Name: TPS_ThrottleAuthorityDefaulted
P0068, P0122, P0123, P0222, P0223, P16F3, P16A0, P16A1, P16A2, P1104, P2100, P2101, P2102, P2103, P2135
Bundle Name: Transmission Output Shaft Angular Velocity Validity
P0722, P0723, P077C, P077D
Bundle Name: TransmissionEngagedState_FA
P1824, P182A, P182B, P182C, P182D, P182E, P182F, P1838, P1839, P1840, P1841, P18B5, P18B6, P18B7, P18B8, P18B9, P18BA, P18BB, P18BC, P18BD, P18BE, P18BF, P18C0, P18C1, P18C2, P18C3, P1915
Bundle Name: TransmissionOutputRotationalStatusValidity
P0722, P0723, P077C, P077D
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: WRAF_Bank_1_FA
P0131, P0132, P064D, P223C, P223E
Bundle Name: WRAF_Bank_2_FA
P0151, P0152, P064E, P223D, P223F

Bundle Name: BrakeBoosterSensorCktFA
P0557, P0558
Bundle Name: EngineModeNotRunTimer_FA
P2610
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: OilPmpTFTKO
P06DA, P06DB, P06DC, P06DD, P06DE
OilPmpTFTKO - Other Definitions: TFTKO only for Output Driver and rationality
Bundle Name: Transmission Oil Temperature Validity
P0667, P0668, P0669, P0711, P0712, P0713
Bundle Name: Transmission Turbine Angular Velocity Validity
P0716, P0717, P07BF, P07C0

Bundle Name: FuelPressureSensorCircuitFA
P018C, P018D

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Fuel Rail Pressure (FRP) Sensor Performance (rationality)	P018B	This DTC detects a fuel pressure sensor response stuck within the normal operating range	Absolute value of fuel pressure change as sensed during intrusive test.	<= 30 kPa	1. FRP Circuit Low DTC (P018C) 2. FRP Circuit High DTC (P018D) 3. FuelPump Circuit Low DTC (P0231) 4. FuelPump Circuit High DTC (P0232) 5. FuelPump Circuit Open DTC (P023F) 6. Reference Voltage DTC (P0641) 7. Fuel Pump Control Module Driver Over-temperature DTC (P064A) 8. Control Module Internal Performance DTC (P0606) 9. Engine run time 10. Emissions fuel level low (PPEI $3FB) 11. Fuel pump control 12. Fuel pump control state 13. Engine fuel flow 14. ECM fuel control system failure (PPEI $1E7)	Not active Not active Not active Not active Not active Not active Not active >=5 seconds Not low Enabled Normal or FRP rationality control > 0.047 g/s Not failed	Frequency: Continuous; 12.5 ms loop. 60 seconds between intrusive tests that pass Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec period); otherwise report Duration of intrusive test is fueling related (5 to 12 seconds). Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	DTC Type B 2 trips
Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage	P018C	This DTC detects if the fuel pressure sensor circuit is shorted low	FRP sensor voltage	< 0.14 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type B 2 trips

16 OBDG05 Fuel Pump Control Module (FPCM) With Active Aero Shutters and Without Performance Exhaust Flow Valves

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Fuel Rail Pressure (FRP) Sensor Circuit High Voltage	P018D	This DTC detects if the fuel pressure sensor circuit is shorted high	FRP sensor voltage	> 4.86 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type B 2 trips
Fuel Pump Control Circuit Low Voltage	P0231	This DTC detects if the fuel pump control circuit is shorted to low	Fuel Pump Current	> 14.48A	Ignition OR Ignition OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank Accessory enabled 9V < voltage < 32V	72 test failures in 80 test samples if Fuel Pump Current <100A 1 sample/12.5 ms	DTC Type A 1 trip
Fuel Pump Control Circuit High Voltage	P0232	This DTC detects if the fuel pump control circuit is shorted to high	Voltage measured at fuel pump circuit	> 3.86 V	Commanded fuel pump output Fuel pump control enable Time that above conditions are met	0% duty cycle (off) False >=4.0 seconds	36 test failures in 40 test samples; 1 sample/12.5ms Pass/Fail determination made only once per trip	DTC Type B 2 trips
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current AND Fuel Pump Duty Cycle	<=0.5A >20%	Ignition switch OR Ignition switch OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank Accessory enabled 9V < voltage < 32V	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip
Fuel System Control Module Enable Control Circuit	P025A	This DTC detects if there is a fault in the fuel pump control enable circuit	PPEI (Powertrain Platform Electrical Interface) Fuel System Request ($1E7)	≠ Fuel Pump Control Module Enable Control Circuit	Ignition AND PPEI Fuel System Request ($1E7)	Run or Crank valid	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Mechanical Actuator Performance (Functionality)	P059F	Compare commanded shutter position to sensed position	Failure to achieve commanded position	Two (2) consecutive intrusive tests fail to achieve commanded position. Intrusive tests are triggered immediately following any failure to achieve a commanded position.	1. Power mode 2. Shutter Control 3. Ignition Run/Crank Voltage	Run/Crank Enabled 11V < voltage < 32V	Frequency: 1 sample after every shutter movement. Intrusive test requested if shutter movement is commanded and position feedback differs after 19.5 seconds; otherwise report pass. Duration of intrusive test is shutter movement related (40 to 80 seconds).	DTC Type B 2 trips
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if any software or calibration check sum is incorrect	Calculated Checksum (CRC16)	≠ stored checksum for any of the parts (boot, software, application calibration, system calibration)	Ignition switch OR Ignition switch OR Fuel Pump Control	Run or Crank Accessory enabled	1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background	DTC Type A 1 trip
Control Module Not Programmed	P0602	Indicates that the ECU needs to be programmed	Calibration KeMEMD_b_NoStartCal	= TRUE	Ignition switch OR Ignition switch OR Fuel Pump Control	Run or Crank Accessory enabled	Runs once at power up	DTC Type A 1 trip
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up	≠ checksum at power-down	Ignition switch OR Ignition switch OR Fuel Pump Control	Run or Crank Accessory enabled	1 failure Frequency: Once at power-up	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Control Module Random Access Memory (RAM)	P0604	Indicates that control module is unable to correctly write and read data to and from RAM	Data read	≠ Data written	Ignition switch OR Ignition switch OR Fuel Pump Control	Run or Crank Accessory enabled	1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background.	DTC Type A 1 trip
Control Module Internal Performance 1. Main Processor Configuration Register Test 2. Processor clock test 3. External watchdog test	P0606	Indicates the ECU has detected an internal processor fault or external watchdog fault (PID $2032 discriminates the source of fault)	1. I/O configuration register faults: •Register contents 2. Processor Clock Fault: • EE latch flag in EEPROM OR • RAM latch flag. 3. External Watchdog Fault: • Software control of fuel pump driver	 =Incorrect value 0x5A5A 0x5A Control Lost	Ignition switch OR Ignition switch OR Fuel pump control 1. For all I/O configuration register faults: Calibration •KeMEMD_b_ProcFltCfgRegEnbl 2. For Processor Clock Fault: Calibration •KeMEMD_b_ProcFltCLKDiagEnbl 3. For External Watchdog Fault: Calibration •KeFRPD_b_FPExtWDogDiagEnbl AND •Control Module ROM(P0601) AND •Control Module RAM(P0604)	Run or Crank Accessory Enabled TRUE TRUE TRUE Not active Not active	 1. 1 failure Frequency: Continuously (12.5ms) 2. 1 failure Frequency: Continuously (12.5ms) 3. 3 failures out of 15 samples 1 sample/12.5 ms	DTC Type A 1 trip
Control Module Long Term Memory (EEPROM) Performance	P062F	Indicates that the NVM Error flag has not been cleared	Last EEPROM write	Did not complete	Ignition switch OR Ignition switch OR Fuel pump control	Run or Crank Accessory Enabled	1 test failure Once on controller power-up	DTC Type B 2 trips
5Volt Reference Circuit (Short High/Low/Out of Range)	P0641	Detects continuous short or out of range on the #1 5V sensor reference circuit	(Reference voltage AND Output) OR	(>= 0.5V inactive)	Ignition	Run or Crank	15 failures out of 20 samples 1 sample/12.5 ms	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
			(Reference voltage AND Output) OR (Reference voltage AND Output) OR	(>= 5.5V active) (<= 4.5V active)				
			Reference voltage	> 105% nominal OR < 95% nominal (i.e., > 5.25v OR < 4.75v)				
Fuel Pump Control Module Driver 1 Over-temperature	P064A	Detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions	Pump Driver Temp	> 150C	Ignition switch OR Ignition switch OR Fuel pump control	Run or Crank Accessory Enabled	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
					KeFRPD_b_FPOverTempDiagEnbl	TRUE		
					Ignition Run_Crank terminal	9V<voltage<32V		
Lost Communication With "Actuator"	P151E	Detects loss of communication condition has occurred between ECU and device Active Grill Air Shutter "A"	PWM Message	Undetected	1. Power mode 2. Ignition Run/Crank Voltage	Run/Crank 11V < voltage < 32V	Frequency: 100ms 150 failures out of 167 samples	DTC Type B 2 trips
Ignition 1 Switch Circuit Low Voltage	P2534	Detects if the Ignition1 Switch circuit is shorted to low or open	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip
Ignition 1 Switch Circuit High Voltage	P2535	Detects if the Ignition1 Switch circuit is shorted to vehicle supply voltage	Ignition 1 voltage	> 11.7 V	Ignition Run_Crank terminal	Off	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Fuel Pump Flow Performance (rationality)	P2635	Detects degradation in the performance of the 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**	1. FRP Circuit Low DTC (P018C)	Not active	Filtered fuel rail pressure error Time Constant = 12.5 seconds Frequency: Continuous 12.5 ms loop	DTC Type B 2 trips
					2. FRP Circuit High DTC (P018D)	Not active .		
					3. Fuel Rail Pressure Sensor Performance DTC (P018B)	Not active		
					4. FuelPump Circuit Low DTC (P0231)	Not active		
					5. FuelPump Circuit High DTC (P0232)	Not active		
					6. FuelPump Circuit Open DTC (P023F)	Not active		
					7. Reference Voltage DTC (P0641)	Not active		
					8. Fuel Pump Control Module Driver Over-temperature DTC's (P064A)	Not active		
					9. Control Module Internal Performance DTC (P0606)	Not active		
					10. ECM fuel control system failure (PPEI $1E7)	Not occurred		
					11. Barometric pressure signal (PPEI $4C1)	Valid (for absolute fuel pressure sensor)		
					12. Engine run time	>= 30 seconds		
					13. Emissions fuel level (PPEI $3FB)	Not low		
					14. Fuel pump control	Enabled		
					15. Fuel pump control state	Normal		
					16. Battery Voltage	11V<=voltage=<32V		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					17. Fuel flow rate **(See Supporting Tables tab)**	> 0.047 g/s **AND** <= Max allowed fuel flow rate as a function of desired rail pressure & Vbatt (Typical values in the range of 11 to 50 g/s)		
					18. Fuel Pressure Control System	Is not responding to an over-pressurization due to pressure build during DFCO or a decreasing desired pressure command.		
Control Module Communication Bus “A” Off	U0073	Detects that a CAN serial data bus shorted condition has occurred to force the CAN device driver to enter a bus-off state	Bus Status	Off	Power mode	Run/Crank	5 failures out of 5 samples (5 seconds)	DTC Type B 2 trips
Lost Communication With ECM/PCM “A”	U0100	Detects that CAN serial data communication has been lost with the ECM	Message $0C9	Undetected	1. Power mode 2. Ignition Run/Crank Voltage 3. U0073	Run/Crank 11V<voltage<32V not active	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Fuel Rail Pressure (FRP) Sensor Performance (rationality)	P018B	This DTC detects a fuel pressure sensor response stuck within the normal operating range	Absolute value of fuel pressure change as sensed during intrusive test.	<= 30 kPa	1. FRP Circuit Low DTC (P018C) 2. FRP Circuit High DTC (P018D) 3. FuelPump Circuit Low DTC (P0231) 4. FuelPump Circuit High DTC (P0232) 5. FuelPump Circuit Open DTC (P023F) 6. Reference Voltage DTC (P0641) 7. Fuel Pump Control Module Driver Over-temperature DTC (P064A) 8. Control Module Internal Performance DTC (P0606) 9. Engine run time 10. Emissions fuel level low (PPEI $3FB) 11. Fuel pump control 12. Fuel pump control state 13. Engine fuel flow 14. ECM fuel control system failure (PPEI $1E7)	1. Not active 2. Not active 3. Not active 4. Not active 5. Not active 6. Not active 7. Not active 8. Not active 9. >=5 seconds 10. Not low 11. Enabled 12. Normal or FRP rationality control 13. > 0.047 g/s 14. Not failed	Frequency: Continuous; 12.5 ms loop. 60 seconds between intrusive tests that pass Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec period); otherwise report Duration of intrusive test is fueling related (5 to 12 seconds). Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	DTC Type B 2 trips
Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage	P018C	This DTC detects if the fuel pressure sensor circuit is shorted low	FRP sensor voltage	< 0.14 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type B 2 trips

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Fuel Rail Pressure (FRP) Sensor Circuit High Voltage	P018D	This DTC detects if the fuel pressure sensor circuit is shorted high	FRP sensor voltage	> 4.86 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type B 2 trips
Fuel Pump Control Circuit Low Voltage	P0231	This DTC detects if the fuel pump control circuit is shorted to low	Fuel Pump Current	> 14.48A	Ignition switch OR Ignition switch OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank Accessory enabled 9V < voltage < 32V	72 test failures in 80 test samples if Fuel Pump Current <100A 1 sample/12.5 ms	DTC Type A 1 trip
Fuel Pump Control Circuit High Voltage	P0232	This DTC detects if the fuel pump control circuit is shorted to high	Voltage measured at fuel pump circuit	> 3.86 V	Commanded fuel pump output Fuel pump control enable Time that above conditions are met	0% duty cycle (off) False >=4.0 seconds	36 test failures in 40 test samples; 1 sample/12.5ms Pass/Fail determination made only once per trip	DTC Type B 2 trips
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current AND Fuel Pump Duty Cycle	<=0.5A >20%	Ignition switch OR Ignition switch OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank Accessory enabled 9V < voltage < 32V	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip
Fuel System Control Module Enable Control Circuit	P025A	This DTC detects if there is a fault in the fuel pump control enable circuit	PPEI (Powertrain Platform Electrical Interface) Fuel System Request ($1E7)	≠ Fuel Pump Control Module Enable Control Circuit	Ignition AND PPEI Fuel System Request ($1E7)	Run or Crank valid	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if any software or calibration check sum is incorrect	Calculated Checksum (CRC16)	≠ stored checksum for any of the parts (boot, software, application calibration, system calibration)	Ignition switch OR Ignition switch	Run or Crank Accessory	1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background	DTC Type A 1 trip

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Control Module Not Programmed	P0602	Indicates that the ECU needs to be programmed	Calibration KeMEMD_b_NoStartCal	= TRUE	Ignition switch OR Ignition switch	Run or Crank Accessory	Runs once at power up	DTC Type A 1 trip
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up	≠ checksum at power-down	Ignition switch OR Ignition switch	Run or Crank Accessory	1 failure Frequency: Once at power-up	DTC Type A 1 trip
Control Module Random Access Memory (RAM)	P0604	Indicates that control module is unable to correctly write and read data to and from RAM	Data read	≠ Data written	Ignition switch OR Ignition switch	Run or Crank Accessory	1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background.	DTC Type A 1 trip
Control Module Internal Performance	P0606	Indicates the ECU has detected an internal processor fault or external watchdog fault (PID $2032 discriminates the source of fault)			Ignition switch OR Ignition switch	(Run or Crank) OR Accessory		DTC Type A 1 trip
1. Main Processor Configuration Register Test			1. I/O configuration register faults: •Register contents	 =Incorrect value	1. For all I/O configuration register faults: Calibration •KeMEMD_b_ProcFltCfgRegEnbl	 TRUE	1. 1 failure Frequency: Continuously (12.5ms)	
2. Processor clock test			2. Processor Clock Fault: • EE latch flag in EEPROM OR • RAM latch flag.	 0x5A5A 0x5A	2. For Processor Clock Fault: Calibration •KeMEMD_b_ProcFltCLKDiagEnbl	 TRUE	2. 1 failure Frequency: Continuously (12.5ms)	
3. External watchdog test			3. External Watchdog Fault: • Software control of fuel pump driver	 Control Lost	3. For External Watchdog Fault: Calibration •KeFRPD_b_FPExtWDogDiagEnbl AND •Control Module ROM(P0601) AND •Control Module RAM(P0604)	 TRUE Not active Not active	3. 3 failures out of 15 samples 1 sample/12.5 ms	

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Control Module Long Term Memory (EEPROM) Performance	P062F	Indicates that the NVM Error flag has not been cleared	Last EEPROM write	Did not complete	Ignition switch OR Ignition switch	(Run or Crank) OR Accessory	1 test failure Once on controller power-up	DTC Type B 2 trips
5Volt Reference Circuit (Short High/Low/Out of Range)	P0641	Detects continuous short or out of range on the #1 5V sensor reference circuit	(Reference voltage AND Output) OR (Reference voltage AND Output) OR (Reference voltage AND Output) OR	(>= 0.5V inactive) (>= 5.5V active) (<= 4.5V active)	Ignition	Run or Crank	15 failures out of 20 samples 1 sample/12.5 ms	DTC Type A 1 trip
			Reference voltage	> 105% nominal OR < 95% nominal (i.e., > 5.25v OR < 4.75v)				
Fuel Pump Control Module Driver 1 Over-temperature	P064A	Detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions	Pump Driver Temp	> 150C	Ignition switch OR Ignition switch	(Run or Crank) OR Accessory	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
					KeFRPD_b_FPOverTempDiagEnbl	TRUE		
					Ignition Run_Crank terminal	9V<voltage<32V		

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Control Circuit/Open	P12E3	Monitors for open circuit faults in the AFM valve PWM control circuit	Open circuit fault status AFM_VlvCntrlCktOpenFlt	== Faulted	1. Diagnostic enabled (K_b_AFM_VlvCntrlOpenEnbl) AND 2. Diagnostic system disablement not requested (DiagSystemDisable) AND 3. AFM Valve Initialization complete (AFM_ValveInitDlyCmpt) AND 4. AFM exhaust valve control not disabled remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. AFM control circuit Open circuit fault status (AFM_VlvCntrlCktOpenFlt)	1. = TRUE AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND 5. <> INDETERMINATE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Control Circuit Low	P12E4	Monitors for short-to-ground faults in the AFM valve PWM control circuit	Short-to-ground fault status AFM_VlvCntrlCktGshtFlt	== Faulted	1. Diagnostic enabled (K_b_AFM_VlvCntrlGshtEnbl) AND 2. Diagnostic system disablement not requested (DiagSystemDisable) AND 3. AFM Valve Initialization complete (AFM_ValveInitDlyCmpt) AND 4. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. AFM control circuit Short-to-ground fault status not indeterminate (AFM_VlvCntrlCktGshtFlt)	1. = TRUE AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND 5. <> INDETERMINATE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Control Circuit High	P12E5	Monitors for short-to-power faults in the AFM valve PWM control circuit	Short-to-power fault status AFM_VlvCntrlCktPshtFlt	== Faulted	1. Diagnostic enabled (K_b_AFM_VlvCntrlPshtEnbl) AND 2. Diagnostic system disablement not requested (DiagSystemDisable) AND 3. AFM Valve Initialization complete (AFM_ValveInitDlyCmpt) AND 4. AFM exhaust valve control not disabled remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. AFM control circuit Short-to-power fault status not indeterminate (AFM_VlvCntrlCktPshtFlt)	1. = TRUE AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND 5. <> INDETERMINATE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Feeback Circuit Low Duty Cycle (Bank 1)	P12E7	Monitors for out-of-range low duty cycle values on the AFM valve 1 diagnostic PWM feedback signal	AFM valve 1 diagnostic PWM feedback signal AFM_Valve1FdbkDC	< K_Pct_AFM_Vlv1PstnLo Thrsh)	1. Diagnostic enabled (K_b_AFM_Vlv1PstnLoDiagEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Duty Cycle (Bank 1)	P12E8	Monitors for out-of-range high duty cycle values on the AFM valve 1 diagnostic PWM feedback signal	AFM valve 1 diagnostic PWM feedback signal AFM_Valve1FdbkDC	> K_Pct_AFM_Vlv1PstnHi Thrsh	1. Diagnostic enabled (K_b_AFM_Vlv1PstnHiDiagEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Open Position (Bank 1)	P12E9	Monitors the sensed AFM valve 1 position for values that are out-of-range low	AFM_Valve1State	<= ValvePstnOOR_Low)	1. Diagnostic enabled (K_b_AFM_Vlv1PstnOOR_LoEnbl) AND 2. AFM valve initialization period completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 1 position sensor circuit low diagnostic not faulted (AFM_Valve1PstnLoFP) AND 5. AFM valve 1 position sensor circuit high diagnostic not faulted (AFM_Valve1PstnHiFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Closed Position (Bank 1)	P12EA	Monitors the sensed AFM valve 1 position for values that are out-of-range high	AFM_Valve1State	>= ValvePstnOOR_High)	1. Diagnostic enabled (K_b_AFM_Vlv1PstnOOR_LoEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 1 position sensor circuit low diagnostic not faulted (AFM_Valve1PstnLoFP) AND 5. AFM valve 1 position sensor circuit high diagnostic not faulted (AFM_Valve1PstnHiFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Low Frequency (Bank 1)	P12EB	Monitors for out-of-range high period (i.e. out-of-range low frequency) values on the AFM valve 1 diagnostic PWM feedback signal	Diagnostic PWM feedback signal_AFM_Valve1DiagFdbkSt	>= DiagFdbkPrdHigh)	1. Diagnostic enabled (K_b_AFM_Vlv1FdbkHiDiagEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Frequency (Bank 1)	P12EC	Monitors for out-of-range low period (i.e. out-of range high frequency) values on the AFM valve 1 diagnostic PWM feedback signal	Diagnostic PWM feedback signal_AFM_Valve1DiagFdbkSt	< = DiagFdbkPrdLow)	1. Diagnostic enabled (K_b_AFM_Vlv1FdbkLoDiagEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Incorrect Frequency (Bank 1)	P12ED	Monitors for in-range errors that result when the sensed period of the diagnostic PWM feedback signal for AFM valve 1 is neither out-of-range low nor out-of-range high and does not fall within any of the calibrated ranges defined for diagnostic feedback data	Diagnostic PWM feedback signal_AFM_Valve1DiagFdbkSt	= DiagFdbkPrdInRngErr)	1. Diagnostic enabled (K_b_AFMV1FdbkInvldDiagEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Stuck Closed (Bank 1)	P12EF	Monitors position feedback to determine if AFM valve 1 is stuck in the closed position	Position feedback AFM_Valve1State	<> AFM_ValveCmd	1. AFM valve1 stuck diagnostics enabled (K_b_AFM_Vlv1StuckDiagEnbl) AND 2. Ignition voltage (IgnitionVoltage) AND 3. AFM Valve initialization (AFM_ValveInitDlyCmpt) AND 4. AFM valve control circuit short-to-power diagnostic fault not active (AFM_VlvCntrlPshtFA) AND	1. = TRUE AND 2. >= 10.2V AND 3. = TRUE AND 4. <> TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					5. AFM valve control circuit short-to-ground diagnostic fault not active (AFM_VlvCntrlGshtFA) AND	5. <> TRUE AND		
					6. AFM valve control circuit open diagnostic fault not active (AFM_VlvCntrlOpenFA) AND	6. <> TRUE AND		
					7. AFM valve1 position sensor circuit low diagnostic fault not active (AFM_Valve1PstnLoFA) AND	7. <> TRUE AND		
					8. AFM valve1 position sensor circuit high diagnostic fault not active (AFM_Valve1PstnHiFA) AND	8. <> TRUE AND		
					9. AFM valve1 position out-of-range low diagnostic fault not active (AFM_Vlv1PstnOOR_LoFA) AND	9. <> TRUE AND		
					10. AFM valve1 position out-of-range high diagnostic fault not active (AFM_Vlv1PstnOOR_HiFA) AND	10. <> TRUE AND		
					11. Diagnostic system disablement (DiagSystemDisable) AND	11. <> TRUE AND		
					12. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND	12. <> TRUE AND		
					13. AFM valve command (AFM_ValveCmd) AND	13. (= OPEN OR = CLOSED) AND		
					14. AFM valve command not changed (AFM_ValveCmd) AND	14. = AFM_ValveCmdPrev AND		
					15. AFM valve response time (AFM_Valve1ResponseTmr ≥ Ke_t_AFM_Valve1ResponseTm) AND	15. >= 1 sec AND		
					16. AFM valve position not out-of-range (AFM_Valve1State)	16. (<> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Stuck Open (Bank 1)	P12F0	Monitors position feedback to determine if AFM valve 1 is stuck in an open position	1. (AFM valve command AND AFM_Valve1State) OR 2. (AFM valve command AND AFM_Valve1State) OR 3. (AFM valve command AND AFM_Valve1State)	1. (= Open AND =ValveInTransition) OR 2. (= Closed AND = ValvePositionOpen) OR 3. (= Closed AND =ValveInTransition)	1. The AFM valve 1 stuck diagnostics are enabled through calibration (K_b_AFM_Vlv1StuckDiagEnbl = TRUE) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					2. Ignition voltage is greater than or equal to the minimum value required to enable diagnostic execution (IgnitionVoltage ≥ K_U_AFM_Vlv1StuckMinVolt) AND	2. >= 10.2 V		
					3. Sufficient time has been allowed for initialization of the AFM valve (AFM_ValveInitDlyCmpt = TRUE) AND	3. = TRUE AND		
					4. An AFM valve control circuit short-to-power diagnostic fault is not active (AFM_VlvCntrlPshtFA = FALSE) AND	4. <> TRUE AND		
					5. An AFM valve control circuit short-to-ground diagnostic fault is not active (AFM_VlvCntrlGshtFA = FALSE) AND	5. <> TRUE AND		
					6. An AFM valve control circuit open diagnostic fault is not active (AFM_VlvCntrlOpenFA = FALSE) AND	6. <> TRUE AND		
					7. An AFM valve 1 position sensor circuit low diagnostic fault is not active (AFM_Valve1PstnLoFA = FALSE) AND	7. <> TRUE AND		
					8. An AFM valve 1 position sensor circuit high diagnostic fault is not active (AFM_Valve1PstnHiFA = FALSE) AND	8. <> TRUE AND		
					9. An AFM valve 1 position out-of-range low diagnostic fault is not active (AFM_Vlv1PstnOOR_LoFA = FALSE) AND	9. <> TRUE AND		
					10. An AFM valve 1 position out-of-range high diagnostic fault is not active (AFM_Vlv1PstnOOR_HiFA = FALSE) AND	10. <> TRUE AND		
					11. Diagnostic system disablement is not being requested (DiagSystemDisable = FALSE) AND	11. <> TRUE AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					12. Control of the AFM exhaust valve has not been disabled for the remainder of the trip due to an output driver short circuit fault (AFMV_FaultTripDsbl = FALSE) AND	12. <> TRUE AND		
					13. The AFM valve is currently being commanded to the open or closed state (AFM_ValveCmd = Open OR AFM_ValveCmd = Closed) AND	13. (= OPEN OR = CLOSED) AND		
					14. The commanded state of the AFM valve has not changed (AFM_ValveCmd = AFM_ValveCmdPrev) AND	14. <> AFM_ValveCmdPrev AND		
					15. Sufficient time has been allowed for the AFM valve to respond to a change in the commanded AFM valve state (AFM_Valve1ResponseTmr ≥ Ke_t_AFM_Valve1ResponseTm) AND	15. >= 1 sec AND		
					16. The sensed position of the AFM valve is not out-of-range (AFM_Valve1State ≠ ValvePstnOOR_Low AND AFM_Valve1State ≠ ValvePstnOOR_High)	16. (<> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		
Cylinder Deactivation Exhaust Flow Valve Position Not Learned (Bank 1)	P12F1	Monitors diagnostic feedback from AFM valve 1 to determine if the valve end stops have not been learned	AFM valve diagnostic feedback status (AFM_Valve1DiagFdbkSt)	= AlignmentNotComplete	1. Diagnostic enabled (K_b_AFM_Vlv1NotLrndEnbl) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND	2. = TRUE AND		
					3. Diagnostic system disablement Not requested (DiagSystemDisable) AND	3. <> TRUE AND		
					4. Diagnostic PWM feedback signal AFM valve1 Not out-of-range low (AFM_Valve1DiagFdbkSt) AND	4. <> DiagFdbkPrdLow AND		
					5. Diagnostic PWM feedback signal AFM valve1 Not out-of-range high (AFM_Valve1DiagFdbkSt) AND	5. <> DiagFdbkPrdHigh AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					6. Diagnostic PWM feedback signal Not out-of-range low, Not out-of-range high AND andNot within any calibrated feedback data range (AFM_Valve1DiagFdbkSt) AND	6. <> DiagFdbkPrdInRngErr AND		
					7. AFM valve state (AFM_Valve1DiagFdbkSt)	7. <> ActuatorFaulted		
Cylinder Deactivation Exhaust Flow Valve Actuator Performance (Bank1)	P12F2	Monitors diagnostic feedback from AFM valve 1 to determine if an internal actuator fault is present or if the AFM valve is stuck in the end stop learning mode	AFM valve command (AFM_ValveCmd) AND Position feedback (AFM_Valve1State)	(= Closed AND = ValveInTransition)	1. Diagnostic enabled (K_b_AFM_Vlv1PerfDiagEnbl) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND	2. = TRUE AND		
					3. Diagnostic system disablement Not requested (DiagSystemDisable) AND	3. <> TRUE AND		
					4. AFM exhaust valve control Not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND	4. <> TRUE AND		
					5. Diagnostic PWM feedback signal AFM valve1 not out-of-range low (AFM_Valve1DiagFdbkSt) AND	5. <> DiagFdbkPrdLow AND		
					6. Diagnostic PWM feedback signal AFM valve1 Not out-of-range high (AFM_Valve1DiagFdbkSt) AND	6. <> DiagFdbkPrdHigh AND		
					7. Diagnostic PWM feedback signal Not out-of-range low, Not out-of-range high AND Not in any calibrated feedback data range (AFM_Valve1DiagFdbkSt) AND	7. <> DiagFdbkPrdInRngErr AND		
					8. AFM valve fault state (AFM_Valve1DiagFdbkSt)	8. <> FaultStIndeterminate		

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Low Duty Cycle (Bank 2)	P12F4	Monitors for out-of-range low duty cycle values on the AFM valve 2 diagnostic PWM feedback signal	AFM valve 2 diagnostic PWM feedback signal AFM_Valve2FdbkDC	< K_Pct_AFM_Vlv2PstnLo Thrsh)	1. Diagnostic enabled (K_b_AFM_Vlv2PstnLoDiagEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Duty Cycle (Bank 2)	P12F5	Monitors for out-of-range high duty cycle values on the AFM valve 2 diagnostic PWM feedback signal	AFM valve 2 diagnostic PWM feedback signal AFM_Valve2FdbkDC	> K_Pct_AFM_Vlv2PstnHi Thrsh)	1. Diagnostic enabled (K_b_AFM_Vlv2PstnHiDiagEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Open Position (Bank 2)	P12F6	Monitors the sensed AFM valve 2 position for values that are out-of-range low	AFM_Valve2State	= ValvePstnOOR_Low	1. Diagnostic enabled (K_b_AFM_Vlv2PstnOOR_LoEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 2 position sensor circuit low diagnostic not faulted (AFM_Valve2PstnLoFP) AND 5. AFM valve2 position sensor circuit high diagnostic unfaulted (AFM_Valve2PstnHiFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Closed Position (Bank 2)	P12F7	Monitors the sensed AFM valve 2 position for values that are out-of-range high	AFM_Valve2State	= ValvePstnOOR_High	1. Diagnostic enabled (K_b_AFM_Vlv2PstnOOR_HiEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 2 position sensor circuit low diagnostic unfaulted (AFM_Valve2PstnLoFP) AND 5. AFM valve 2 position sensor circuit high diagnostic unfaulted (AFM_Valve2PstnHiFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Low Frequency (Bank 2)	P12F8	Monitors for out-of-range high period (i.e. out-of-range low frequency) values on the AFM valve 2 diagnostic PWM feedback signal	Diagnostic PWM feedback signal AFM_Valve2DiagFdbkSt	>= DiagFdbkPrdHigh)	1. Diagnostic enabled (K_b_AFM_Vlv2FdbkHiDiagEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Frequency (Bank 2)	P12F9	Monitors for out-of-range low period (i.e. out-of-range high frequency) values on the AFM valve 2 diagnostic PWM feedback signal	Diagnostic PWM feedback signal AFM_Valve2DiagFdbkSt	< DiagFdbkPrdLow)	1. Diagnostic enabled through calibration (K_b_AFM_Vlv2FdbkLoDiagEnbl) AND 2. AFM valve initialization period has completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement is not being requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Incorrect Frequency (Bank 2)	P12FA	Monitors for in-range errors that result when the sensed period of the diagnostic PWM feedback signal for AFM valve 2 is neither out-of-range low nor out-of-range high and does not fall within any of the calibrated ranges defined for diagnostic feedback data	Diagnostic PWM feedback signal_AFM_Valve2DiagFdbkSt	= DiagFdbkPrdInRngErr)	1. Diagnostic enabled (K_b_AFMV2FdbkInvldDiagEnbl) AND 2. AFM valve initialization period complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Stuck Closed (Bank 2)	P12FC	Monitors position feedback to determine if AFM valve 2 is stuck in the closed position	AFM valve command AND AFM Valve2 State (AFM_ValveCmd AND AFM_Valve2State)	(= Open AND = ValvePstnClosed)	1. AFM valve2 stuck diagnostics enabled (K_b_AFM_Vlv2StuckDiagEnbl) AND 2. IgnitionVoltage ≥ K_U_AFM_Vlv2StuckMinVolt AND 3. AFM valve initialized (AFM_ValveInitDlyCmplt) AND	1. = TRUE AND 2. V >= 10.2 V AND 3. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					4. AFM valve control circuit short-to-power diagnostic fault (AFM_VlvCntrlPshtFA) AND	4. <> TRUE AND		
					5. AFM valve control circuit short-to-ground diagnostic fault (AFM_VlvCntrlGshtFA) AND	5. <> TRUE AND		
					6. AFM valve control circuit open diagnostic fault (AFM_VlvCntrlOpenFA) AND	6. <> TRUE AND		
					7. AFM valve2 position sensor circuit low diagnostic fault (AFM_Valve2PstnLoFA) AND	7. <> TRUE AND		
					8. AFM valve2 position sensor circuit high diagnostic fault (AFM_Valve2PstnHiFA) AND	8. <> TRUE AND		
					9. AFM valve2 position out-of-range low diagnostic fault (AFM_Vlv2PstnOOR_LoFA) AND	9. <> TRUE AND		
					10. AFM valve2 position out-of-range high diagnostic fault (AFM_Vlv2PstnOOR_HiFA) AND	10. <> TRUE AND		
					11. Diagnostic system disablement Not requested (DiagSystemDisable) AND	11. <> TRUE AND		
					12. AFM exhaust valve control Not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND	12. <> TRUE AND		
					13. AFM valve command (AFM_ValveCmd) AND	13. (= Open OR = Closed) AND		
					14. AFM valve command Not changed (AFM_ValveCmd) AND	14. = AFM_ValveCmdPrev AND		
					15. AFM valve response time (AFM_Valve2ResponseTmr) AND	15. >= 1 sec AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					16. AFM valve position Not out-of-range (AFM_Valve2State AND AFM_Valve2State)	16. (<> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		
Cylinder Deactivation Exhaust Flow Valve Stuck Open (Bank 2)	P12FD	Monitors position feedback to determine if AFM valve 2 is stuck in an open position	1. (AFM_ValveCmd AND AFM_Valve2State) OR 2. (AFM_ValveCmd AND AFM_Valve2State) OR 3. (AFM_ValveCmd AND AFM_Valve2State)	1. (= Open AND = ValveInTransition) OR 2. (= Closed AND = ValvePstnOpen) OR 3. (= Closed AND = ValveInTransition)	1. AFM valve2 stuck diagnostics enabled (K_b_AFM_Vlv2StuckDiagEnbl) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					2. Ignition voltage (IgnitionVoltage) AND	2. V >= 10.2 V AND		
					3. AFM valve initialization time complete (AFM_ValveInitDlyCmpt) AND	3. = TRUE AND		
					4. AFM valve control circuit short-to-power diagnostic fault (AFM_VlvCntrlPshtFA) AND	4. <> TRUE AND		
					5. AFM valve control circuit short-to-ground diagnostic fault (AFM_VlvCntrlGshtFA) AND	5. <> TRUE AND		
					6. AFM valve control circuit open diagnostic fault (AFM_VlvCntrlOpenFA) AND	6. <> TRUE AND		
					7. AFM valve2 position sensor circuit low diagnostic fault (AFM_Valve2PstnLoFA) AND	7. <> TRUE AND		
					8. AFM valve2 position sensor circuit high diagnostic fault (AFM_Valve2PstnHiFA) AND	8. <> TRUE AND		
					9. AFM valve2 position out-of-range low diagnostic fault (AFM_Vlv2PstnOOR_LoFA) AND	9. <> TRUE AND		
					10. AFM valve2 position out-of-range high diagnostic fault (AFM_Vlv2PstnOOR_HiFA) AND	10. <> TRUE AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					11. Diagnostic system disablement (DiagSystemDisable) AND	11. <> TRUE AND		
					12. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND	12. <> TRUE AND		
					13. AFM valve command (AFM_ValveCmd) AND	13. (= Open OR = Closed) AND		
					14. AFM valve command unchanged (AFM_ValveCmd) AND	14. = AFM_ValveCmdPrev AND		
					15. AFM valve command response time (AFM_Valve2ResponseTmr) AND	15. >= 1 sec AND		
					16. AFM valve position not out-of-range (AFM_Valve2State)	16. (<> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		
Cylinder Deactivation Exhaust Flow Valve Position Not Learned (Bank 2)	P12FE	Monitors diagnostic feedback from AFM valve 2 to determine if the valve end stops have not been learned	AFM Valve Diagnostic Status enumeration (AFM_Valve2DiagFdbkSt)	= AlignmentNotComplete)	1. Diagnostic enabled (K_b_AFM_Vlv2NotLrndEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM Valve2 diagnostic PWM feedback not out-of-range low (AFM_Valve2DiagFdbkSt) AND 5. AFM Valve2 diagnostic PWM feedback signal not out-of-range high (AFM_Valve2DiagFdbkSt) AND 6. AFM Valve2 diagnostic PWM feedback signal Not out-of-range low, Not out-of-range high AND Not in any calibrated feedback data range (AFM_Valve1DiagFdbkSt) AND 7. AFM valve diagnostic feedback state (AFM_Valve2DiagFdbkSt)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> DiagFdbkPrdLow AND 5. <> DiagFdbkPrdHigh AND 6. <> DiagFdbkPrdInRngErr AND 7. <> Actuator Faulted	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Actuator Performance (Bank2)	P12FF	Monitors diagnostic feedback from AFM valve 2 to determine if an internal actuator fault is present or if the AFM valve is stuck in the end stop learning mode	1. AFM Valve2 Diagnostic Status (AFM_Valve2DiagFdbkSt) OR 2. (AFM Valve2 Diagnostic Status AND AFM Valve Command) OR 3. (AFM Valve2 Diagnostic Status AND AFM Valve Command)	1. = Faulted OR 2. (= OpenEndStopLearned AND <> OpenEndStopLearn) OR 3. (= ClosedEndStopLearned AND <> ClosedEndStopLearn)	1. Diagnostic enabled (K_b_AFM_Vlv2PerfDiagEnbl) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND	2. = TRUE AND		
					3. Diagnostic system disablement (DiagSystemDisable) AND	3. <> TRUE AND		
					4. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND	4. <> TRUE AND		
					5. Diagnostic PWM feedback signal AFM Valve2 not out-of-range low (AFM_Valve2DiagFdbkSt) AND	5. <> DiagFdbkPrdLow AND		
					6. Diagnostic PWM feedback signal AFM Valve2 not out-of-range high (AFM_Valve2DiagFdbkSt) AND	6. <> DiagFdbkPrdHigh AND		
					7. Diagnostic PWM feedback Not out-of-range low, Not out-of-range high AND not within any of the calibrated feedback data range (AFM_Valve2DiagFdbkS) AND	7. <> DiagFdbkPrdInRngErr AND		
					8. AFM valve fault state (AFM_Valve2DiagFdbkSt)	8. <> FaultStIndeterminate		
Ignition 1 Switch Circuit Low Voltage	P2534	Detects if the Ignition1 Switch circuit is shorted to low or open	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip
Ignition 1 Switch Circuit High Voltage	P2535	Detects if the Ignition1 Switch circuit is shorted to vehicle supply voltage	Ignition 1 voltage	> 11.7 V	Ignition Run_Crank terminal	Off	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Fuel Pump Flow Performance (rationality)	P2635	Detects degradation in the performance of the 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**			Filtered fuel rail pressure error Time Constant = 12.5 seconds Frequency: Continuous 12.5 ms loop	DTC Type B 2 trips
					1. FRP Circuit Low DTC (P018C)	1. Not active		
					2. FRP Circuit High DTC (P018D)	2. Not active		
					3. Fuel Rail Pressure Sensor Performance DTC (P018B)	3. Not active		
					4. FuelPump Circuit Low DTC (P0231)	4. Not active		
					5. FuelPump Circuit High DTC (P0232)	5. Not active		
					6. FuelPump Circuit Open DTC (P023F)	6. Not active		
					7. Reference Voltage DTC (P0641)	7. Not active		
					8. Fuel Pump Control Module Driver Over-temperature DTC's (P064A)	8. Not active		
					9. Control Module Internal Performance DTC (P0606)	9. Not active		
					10. ECM fuel control system failure (PPEI $1E7)	10. Not occurred		
					11. Barometric pressure signal (PPEI $4C1)	11. Valid (for absolute fuel pressure sensor)		
					12. Engine run time	12. >= 30 seconds		
					13. Emissions fuel level (PPEI $3FB)	13. Not low		
					14. Fuel pump control	14. Enabled		
					15. Fuel pump control state	15. Normal		
					16. Battery Voltage	16. 11V<=voltage=<32V		
					17. Fuel flow rate **(See Supporting Tables tab)**	17. > 0.047 g/s **AND** <= Max allowed fuel flow rate as a function of desired rail pressure & Vbatt (Typical values in the range of 11 to 50 g/s)		

16 OBDG05 Fuel Pump Control Module (FPCM) With Performance Exhaust Flow Valves and Without Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					18. Fuel Pressure Control System	18. Is not responding to an over-pressurization due to pressure build during DFCO or a decreasing desired pressure command.		
Control Module Communication Bus “A” Off	U0073	Detects that a CAN serial data bus shorted condition has occurred to force the CAN device driver to enter a bus-off	Bus Status	Off	Power mode	Run/Crank	5 failures out of 5 samples (5 seconds)	DTC Type B 2 trips
Lost Communication With ECM/PCM “A”	U0100	Detects that CAN serial data communication has been lost with the ECM	Message $0C9	Undetected	1. Power mode 2. Ignition Run/Crank Voltage 3. U0073	Run/Crank 11V<voltage<32V not active	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips

16 OBDG05 Fuel Pump Control Module (FPCM) Without Performance Exhaust Flow Valves or Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Fuel Rail Pressure (FRP) Sensor Performance (rationality)	P018B	This DTC detects a fuel pressure sensor response stuck within the normal operating range	Absolute value of fuel pressure change as sensed during intrusive test.	<= 30 kPa	1. FRP Circuit Low DTC (P018C) 2. FRP Circuit High DTC (P018D) 3. FuelPump Circuit Low DTC (P0231) 4. FuelPump Circuit High DTC (P0232) 5. FuelPump Circuit Open DTC (P023F) 6. Reference Voltage DTC (P0641) 7. Fuel Pump Control Module Driver Over-temperature DTC (P064A) 8. Control Module Internal Performance DTC (P0606) 9. Engine run time 10. Emissions fuel level low (PPEI $3FB) 11. Fuel pump control 12. Fuel pump control state 13. Engine fuel flow 14. ECM fuel control system failure (PPEI $1E7)	Not active Not active Not active Not active Not active Not active Not active >=5 seconds Not low Enabled Normal or FRP rationality control > 0.047 g/s Not failed	Frequency: Continuous; 12.5 ms loop. 60 seconds between intrusive tests that pass Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec period); otherwise report Duration of intrusive test is fueling related (5 to 12 seconds). Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	DTC Type B 2 trips
Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage	P018C	This DTC detects if the fuel pressure sensor circuit is shorted low	FRP sensor voltage	< 0.14 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type B 2 trips

16 OBDG05 Fuel Pump Control Module (FPCM) Without Performance Exhaust Flow Valves or Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Fuel Rail Pressure (FRP) Sensor Circuit High Voltage	P018D	This DTC detects if the fuel pressure sensor circuit is shorted high	FRP sensor voltage	> 4.86 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type B 2 trips
Fuel Pump Control Circuit Low Voltage	P0231	This DTC detects if the fuel pump control circuit is shorted to low	Fuel Pump Current	> 14.48A	Ignition switch OR Ignition switch OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank Accessory enabled 9V < voltage < 32V	72 test failures in 80 test samples if Fuel Pump Current <100A 1 sample/12.5 ms	DTC Type A 1 trip
Fuel Pump Control Circuit High Voltage	P0232	This DTC detects if the fuel pump control circuit is shorted to high	Voltage measured at fuel pump circuit	> 3.86 V	Commanded fuel pump output Fuel pump control enable Time that above conditions are met	0% duty cycle (off) False >=4.0 seconds	36 test failures in 40 test samples; 1 sample/12.5ms Pass/Fail determination made only once per trip	DTC Type B 2 trips
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current AND Fuel Pump Duty Cycle	<=0.5A >20%	Ignition switch OR Ignition switch OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank Accessory enabled 9V < voltage < 32V	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip
Fuel System Control Module Enable Control Circuit	P025A	This DTC detects if there is a fault in the fuel pump control enable circuit	PPEI (Powertrain Platform Electrical Interface) Fuel System Request ($1E7)	≠ Fuel Pump Control Module Enable Control Circuit	Ignition AND PPEI Fuel System Request ($1E7)	Run or Crank valid	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if any software or calibration check sum is incorrect	Calculated Checksum (CRC16)	≠ stored checksum for any of the parts (boot, software, application calibration, system calibration)	Ignition switch OR Ignition switch OR	Run or Crank Accessory	1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background	DTC Type A 1 trip

16 OBDG05 Fuel Pump Control Module (FPCM) Without Performance Exhaust Flow Valves or Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					Fuel Pump Control	enabled		
Control Module Not Programmed	P0602	Indicates that the ECU needs to be programmed	Calibration KeMEMD_b_NoStartCal	= TRUE	Ignition switch OR Ignition switch OR Fuel Pump Control	Run or Crank Accessory enabled	Runs once at power up	DTC Type A 1 trip
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up	≠ checksum at power-down	Ignition switch OR Ignition switch OR Fuel Pump Control	Run or Crank Accessory enabled	1 failure Frequency: Once at power-up	DTC Type A 1 trip
Control Module Random Access Memory (RAM)	P0604	Indicates that control module is unable to correctly write and read data to and from RAM	Data read	≠ Data written	Ignition switch OR Ignition switch OR Fuel Pump Control	Run or Crank Accessory enabled	1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background.	DTC Type A 1 trip
Control Module Internal Performance 1. Main Processor Configuration Register Test 2. Processor clock test	P0606	Indicates the ECU has detected an internal processor fault or external watchdog fault (PID $2032 discriminates the source of fault)	1. I/O configuration register faults: •Register contents 2. Processor Clock Fault: • EE latch flag in EEPROM OR • RAM latch flag.	 =Incorrect value 0x5A5A 0x5A	Ignition switch OR Ignition switch OR Fuel pump control 1. For all I/O configuration register faults: Calibration •KeMEMD_b_ProcFltCfgRegEnbl 2. For Processor Clock Fault: Calibration •KeMEMD_b_ProcFltCLKDiagEnbl	Run or Crank Accessory Enabled TRUE TRUE	 1. 1 failure Frequency: Continuously (12.5ms) 2. 1 failure Frequency: Continuously (12.5ms)	DTC Type A 1 trip

16 OBDG05 Fuel Pump Control Module (FPCM) Without Performance Exhaust Flow Valves or Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
3. External watchdog test			3. External Watchdog Fault: • Software control of fuel pump driver	Control Lost	3. For External Watchdog Fault: Calibration •KeFRPD_b_FPExtWDogDiagEnbl AND •Control Module ROM(P0601) AND •Control Module RAM(P0604)	 TRUE Not active Not active	3. 3 failures out of 15 samples 1 sample/12.5 ms	
Control Module Long Term Memory (EEPROM) Performance	P062F	Indicates that the NVM Error flag has not been cleared	Last EEPROM write	Did not complete	Ignition switch OR Ignition switch OR Fuel pump control	Run or Crank Accessory Enabled	1 test failure Once on controller power-up	DTC Type B 2 trips
5Volt Reference Circuit (Short High/Low/Out of Range)	P0641	Detects continuous short or out of range on the #1 5V sensor reference circuit	(Reference voltage AND Output) OR (Reference voltage AND Output) OR (Reference voltage AND Output) OR	(>= 0.5V inactive) (>= 5.5V active) (<= 4.5V active)	Ignition	Run or Crank	15 failures out of 20 samples 1 sample/12.5 ms	DTC Type A 1 trip
			Reference voltage	> 105% nominal OR < 95% nominal (i.e., > 5.25v OR < 4.75v)				
Fuel Pump Control Module Driver 1 Over-temperature	P064A	Detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions	Pump Driver Temp	> 150C	Ignition switch OR Ignition switch OR Fuel pump control	Run or Crank Accessory Enabled	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
					KeFRPD_b_FPOverTempDiagEnbl	TRUE		
					Ignition Run_Crank terminal	9V<voltage<32V		
Ignition 1 Switch Circuit Low Voltage	P2534	This DTC detects if the Ignition1 Switch circuit is shorted to low or open	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip

16 OBDG05 Fuel Pump Control Module (FPCM) Without Performance Exhaust Flow Valves or Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Ignition 1 Switch Circuit High Voltage	P2535	Detects if the Ignition1 Switch circuit is shorted to vehicle supply voltage	Ignition 1 voltage	> 11.7 V	Ignition Run_Crank terminal	Off	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip
Fuel Pump Flow Performance (rationality)	P2635	Detects degradation in the performance of the 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**			Filtered fuel rail pressure error Time Constant = 12.5 seconds Frequency: Continuous 12.5 ms loop	DTC Type B 2 trips
					1. FRP Circuit Low DTC (P018C)	Not active		
					2. FRP Circuit High DTC (P018D)	Not active .		
					3. Fuel Rail Pressure Sensor Performance DTC (P018B)	Not active		
					4. FuelPump Circuit Low DTC (P0231)	Not active		
					5. FuelPump Circuit High DTC (P0232)	Not active		
					6. FuelPump Circuit Open DTC (P023F)	Not active		
					7. Reference Voltage DTC (P0641)	Not active		
					8. Fuel Pump Control Module Driver Over-temperature DTC's (P064A)	Not active		
					9. Control Module Internal Performance DTC (P0606)	Not active		
					10. ECM fuel control system failure (PPEI $1E7)	Not occurred		
					11. Barometric pressure signal (PPEI $4C1)	Valid (for absolute fuel pressure sensor)		
					12. Engine run time	>= 30 seconds		
					13. Emissions fuel level (PPEI $3FB)	Not low		
					14. Fuel pump control	Enabled		
					15. Fuel pump control state	Normal		
					16. Battery Voltage	11V<=voltage=<32V		

16 OBDG05 Fuel Pump Control Module (FPCM) Without Performance Exhaust Flow Valves or Active Aero Shutters

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					17. Fuel flow rate **(See Supporting Tables tab)**	> 0.047 g/s **AND** <= Max allowed fuel flow rate as a function of desired rail pressure & Vbatt (Typical values in the range of 11 to 50 g/s)		
					18. Fuel Pressure Control System	Is not responding to an over-pressurization due to pressure build during DFCO or a decreasing desired pressure command.		
Control Module Communication Bus "A" Off	U0073	Detects that a CAN serial data bus shorted condition has occurred to force the CAN device driver to enter a bus-off	Bus Status	Off	Power mode	Run/Crank	5 failures out of 5 samples (5 seconds)	DTC Type B 2 trips
Lost Communication With ECM/PCM "A"	U0100	Detects that CAN serial data communication has been lost with the ECM	Message $0C9	Undetected	1. Power mode 2. Ignition Run/Crank Voltage 3. U0073	Run/Crank 11V<voltage<32V not active	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips

P2635 Fuel Pump Performance Maximum Fuel Flow map (grams / s)

X-axis= Desired Fuel Pressure (kiloPascals)

Y-axis= Battery voltage (volts)

	200	250	300	350	400	450	500	550	600
4.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
6	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
7.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
9	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
10.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
12	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
13.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
15	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
16.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
18	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
19.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
21	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
22.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
24	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
25.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
27	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
28.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5

P2635 Fuel Pump Performance Filtered Pressure Error Fault Threshold High map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
0	30	37.5	45	52.5	60	67.5	75	82.5	90
1.5	30	37.5	45	52.5	60	67.5	75	82.5	90
3	30	37.5	45	52.5	60	67.5	75	82.5	90
4.5	30	37.5	45	52.5	60	67.5	75	82.5	90
6	30	37.5	45	52.5	60	67.5	75	82.5	90
7.5	30	37.5	45	52.5	60	67.5	75	82.5	90
9	30	37.5	45	52.5	60	67.5	75	82.5	90
10.5	30	37.5	45	52.5	60	67.5	75	82.5	90
12	30	37.5	45	52.5	60	67.5	75	82.5	90
13.5	30	37.5	45	52.5	60	67.5	75	82.5	90
15	30	37.5	45	52.5	60	67.5	75	82.5	90
16.5	30	37.5	45	52.5	60	67.5	75	82.5	90
18	30	37.5	45	52.5	60	67.5	75	82.5	90
19.5	30	37.5	45	52.5	60	67.5	75	82.5	90
21	30	37.5	45	52.5	60	67.5	75	82.5	90
22.5	30	37.5	45	52.5	60	67.5	75	82.5	90
24	30	37.5	45	52.5	60	67.5	75	82.5	90
25.5	30	37.5	45	52.5	60	67.5	75	82.5	90
27	30	37.5	45	52.5	60	67.5	75	82.5	90
28.5	30	37.5	45	52.5	60	67.5	75	82.5	90
30	30	37.5	45	52.5	60	67.5	75	82.5	90
31.5	30	37.5	45	52.5	60	67.5	75	82.5	90
33	30	37.5	45	52.5	60	67.5	75	82.5	90
34.5	30	37.5	45	52.5	60	67.5	75	82.5	90
36	30	37.5	45	52.5	60	67.5	75	82.5	90
37.5	30	37.5	45	52.5	60	67.5	75	82.5	90
39	30	37.5	45	52.5	60	67.5	75	82.5	90

P2635 (Continued…) Fuel Pump Performance Filtered Pressure Error Fault Threshold High map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
40.5	30	37.5	45	52.5	60	67.5	75	82.5	90
42	30	37.5	45	52.5	60	67.5	75	82.5	90
43.5	30	37.5	45	52.5	60	67.5	75	82.5	90
45	30	37.5	45	52.5	60	67.5	75	82.5	90
46.5	30	37.5	45	52.5	60	67.5	75	82.5	90
48	30	37.5	45	52.5	60	67.5	75	82.5	90

P2635 Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold High map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
0	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
1.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
3	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
4.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
6	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
7.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
9	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
10.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
12	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
13.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
15	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
16.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
18	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
19.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5

P2635 (Continued…) Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold High map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
21	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
22.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
24	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
25.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
27	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
28.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
30	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
31.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
33	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
34.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
36	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
37.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
39	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
40.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
42	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
43.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
45	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
46.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
48	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5

P2635 Fuel Pump Performance Filtered Pressure Error Fault Threshold Low map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
0	-260	-210	-160	-110	-60	-67.5	-75	-82.5	-90
1.5	-145	-125	-102.5	-81.25	-60	-67.5	-75	-82.5	-90

P2635 (Continued…) Fuel Pump Performance Filtered Pressure Error Fault Threshold Low map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
3	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
4.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
6	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
7.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
9	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
10.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
12	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
13.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
15	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
16.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
18	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
19.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
21	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
22.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
24	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
25.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
27	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
28.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
30	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
31.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
33	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
34.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
36	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
37.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
39	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
40.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
42	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90

P2635 (Continued…) Fuel Pump Performance Filtered Pressure Error Fault Threshold Low map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
43.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
45	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
46.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
48	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90

P2635 Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold Low map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
0	-221	-178.5	-136	-93.5	-51	-57.375	-63.75	-70.125	-76.5
1.5	-123.25	-106.25	-87.125	-69.0625	-51	-57.375	-63.75	-70.125	-76.5
3	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
4.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
6	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
7.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
9	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
10.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
12	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
13.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
15	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
16.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
18	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
19.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
21	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
22.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
24	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5

P2635 (Continued…) Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold Low map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
25.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
27	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
28.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
30	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
31.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
33	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
34.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
36	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
37.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
39	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
40.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
42	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
43.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
45	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
46.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
48	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5