COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Intake Camshaft Actuator Solenoid Circuit – Bank 1	P0010	Detects a VVT system error by monitoring the circuit for electrical integrity	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		System supply voltage is within limits Output driver is commanded on, Ignition switch is in crank or run position	> 11 Volts, and < 32 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B 2 trips
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 > KtPHSD_phi_CamPosErrorLimIc 1 Deg (see Supporting Table)	The following DTC's are NOT active: P0010 IntkCMP B1 Circuit P0340, P0341, Intake B1 Cam sensors P0335, P0336, Crank sensors P0016, P0017, P0018, P0019 Cam to crank rationality Engine is running VVT is enabled Desired camshaft position > 0 Power Take Off (PTO) not active	Run/Crank Voltage > 11 Volts, and Run/Crank Voltage < 32 Volts Both Desired & Measured cam positions cannot be < KtPHSD_phi_CamPos ErrorLimIc1 or > than (25.0 - KtPHSD_phi_CamPos ErrorLimIc1). Desired cam position cannot vary more than 3.0 Cam Deg for at least KtPHSD_t_StablePositi onTimeIc1 seconds (see Supporting Tables)	135 failures out of 150 samples 100 ms /sample	Type B 2 trips
Exhaust Camshaft Actuator Solenoid Circuit – Bank 1	P0013	Detects a VVT system error by monitoring the circuit for electrical integrity	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		System supply voltage is within limits Output driver is commanded on, Ignition switch is in crank or run position	> 11 Volts, and < 32 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL 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 > KtPHSD_phi_CamPosErrorLimEc1 Deg (see Supporting Table)	The following DTC's are NOT active: P0013 ExhCMP B1 Circuit P0365, P0366, Exh B1 Cam sensors P0335, P0336, Crank sensors P0016, P0017, P0018, P0019 Cam to crank rationality Engine is running VVT is enabled Desired camshaft position > 0 Power Take Off (PTO) not active	Run/Crank Voltage > 11 Volts, and Run/Crank Voltage < 32 Volts Both Desired & Measured cam positions cannot be < KtPHSD_phi_CamPosErrorLimEc1 or > than (Exh25.0 - KtPHSD_phi_CamPosErrorLimEc1). Desired cam position cannot vary more than 3.0 Cam Deg for at least KtPHSD_t_StablePositionTimeEc1 seconds (see Supporting Tables)	135 failures out of 150 samples 100 ms /sample	Type B 2 trips
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 Sensor A	P0016	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 1 sensor A occurs during the incorrect crank position	4 cam sensor pulses more than -9 crank degrees before or 12 crank degrees after nominal position in one cam revolution.		Crankshaft and camshaft position signals are synchronized Engine is Spinning Cam phaser is in "parked" position No Active DTCs: Time since last execution of diagnostic	P0335, P0336 P0340, P0341 5VoltReferenceA_FA 5VoltReferenceB_FA	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. There is a delay after the first failed test to allow the camshaft position to return to the park position. This time is defined by the table "Cam Correlation Oil Temperature Threshold".	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					diagnostic	< 1.0 seconds	One sample per cam rotation	
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 Sensor B	P0017	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 1 sensor B occurs during the incorrect crank position	4 cam sensor pulses more than -9 crank degrees before or 12 crank degrees after nominal position in one cam revolution.		Crankshaft and camshaft position signals are synchronized Engine is Spinning Cam phaser is in "parked" position No Active DTCs: Time since last execution of diagnostic	 P0335, P0336 P0365, P0366 5VoltReferenceA_FA 5VoltReferenceB_FA < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. There is a delay after the first failed test to allow the camshaft position to return to the park position. This time is defined by the table "Cam Correlation Oil Temperature Threshold". One sample per cam rotation	Type B 2 trips
O2S Heater Control Circuit Bank 1 Sensor 1	P0030	This DTC checks the Heater Output Driver circuit for electrical integrity.	Voltage low during driver open state (indicates short-to-ground or open circuit) or voltage high during driver closed state (indicates short to voltage).		Ign Switch position Ignition Voltage Engine Speed	= Crank or Run position 11.0 volts < Ign Voltage < 32.0 volts > 400 RPM	20 failures out of 25 samples 250 ms /sample Continuous	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2S Heater Control Circuit Bank 1 Sensor 2	P0036	This DTC checks the Heater Output Driver circuit for electrical integrity.	Voltage low during driver open state (indicates short-to-ground or open circuit) or voltage high during driver closed state (indicates short to voltage).		Ign Switch position Ignition Voltage Engine Speed	= Crank or Run position 11.0 volts < Ign Voltage < 32.0 volts > 400 RPM	20 failures out of 25 samples 250 ms /sample Continuous	2 trips Type B
HO2S Heater Resistance Bank 1 Sensor 1	P0053	Detects an oxygen sensor heater having an incorrect or out of range resistance value.	Learned Heater Resistance.	Calculated Heater Resistance < 3.7 ohms -OR- Calculated Heater Resistance > 8.7 ohms	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 ºC > 28800 seconds -30.0 ºC ≤ Coolant ≤ 45.0 ºC < 32.0 volts	Once per valid cold start	2 trips Type B
					Learn occurs when engine run time is less than the sum of the two following calibrations: Engine Run time Additional Engine Run time delay	< 0.200 seconds < 0.000 seconds		
HO2S Heater Resistance Bank 1 Sensor 2	P0054	Detects an oxygen sensor heater having an incorrect or out of range resistance value.	Learned Heater Resistance.	Calculated Heater Resistance < 3.6 ohms -OR- Calculated Heater Resistance > 10.3 ohms	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 ºC > 28800 seconds -30.0 ºC ≤ Coolant ≤ < 32.0 volts	Once per valid cold start	2 trips Type B
					Learn occurs when engine run time is less than the sum of the two following calibrations: Engine Run time Additional Engine Run time delay	< 0.200 seconds < 0.100 seconds		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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	1) 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	Table, f(TPS). See supporting tables	Engine Speed	> 800 RPM Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	Continuously fail MAP and MAF portions of diagnostic for 0.1875 s	Type: A MIL: YES Trips: 1
			2) 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 Run/Crank Voltage, then MAF portion of diagnostic fails	Table, f(TPS). See supporting tables Table, f(RPM). See supporting tables Table, f(Volts). See supporting tables			Continuous in MAIN processor	
Internal Control Module SIDI High Pressure Pump min/max authority	P0089	This DTC Detects pump control windup to its max or min authority	High Pressure Fuel Pump Delivery Angle Or High Pressure Fuel Pump Delivery Angle	≥ 240 ° ≤ 0 °	Run/Crank 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	11 ≤ Volts ≤ 32 > 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Windup High - 750 failures out of 938 samples Windup Low - 750 failures out of 938 Samples	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and 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			
High Pressure Pump Cntrl Solenoid Enable Low Side Open Circuit	P0090	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the high pressure fuel pump solenoid low side is open circuit		Engine Speed Run/Crank Voltage	≥ 50 RPM 11 ≤ volts ≤ 32 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	1 trips Type A
High Pressure Pump Cntrl Solenoid Enable Low Side Short to Ground	P0091	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the high pressure fuel pump solenoid low side is short to ground		Engine Speed Run/Crank Voltage	≥ 50 RPM 11 ≤ volts ≤ 32 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	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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	P0092	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the high pressure fuel pump solenoid low side is short to power		Engine Speed Run/Crank Voltage	≥ 50 RPM 11 ≤ volts ≤ 32 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	1 trips Type A
High Pressure Start Diagnostic	P00C6	This DTC checks the high side fuel pressure during engine cranking	The ECM detects that the fuel pressure is not rising or has fallen beyond acceptable limits during engine cranking	Pressure Fall Test: High Side Fuel Rail Pressure ≤ Supporting Table KtFHPD_p_HPS_PressFallLoThrsh Pressure Rise Test: High Side Fuel Pressure < Supporting Table KtFHPC_p_HighPressStart	Low side feed fuel pressure Engine Run Time Run/Crank Voltage Engine Coolant	≥ 0.300 MPa < = 0 > 8 Volts -100 ≤ °C ≤ 80 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	Pressure Fall Test: Injected cylinder events ≥ Supporting Table KtFHPD_Cnt_HPS_PressFallLoThrsh Pressure Rise Test: Time ≥ Supporting Table KtFHPC_t_HighPressStartTmout	2 trips Type B
					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	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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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		
Fuel Press Regulator Solenoid Supply Voltage Control Circuit/Open	P00C8	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the Fuel Press Regulator Solenoid Supply Voltage Control Circuit/Open		Engine Speed Run/Crank Voltage	≥ 50 RPM 11 ≤ Volts ≤ 32 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	1 trips Type A
Fuel Press Regulator Solenoid Supply Voltage Control Circuit Low	P00C9	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the Fuel Press Regulator Solenoid Supply Voltage Control short to ground		Engine Speed Run/Crank Voltage	≥ 50 RPM 11 ≤ Volts ≤ 32 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	1 trips Type A
Fuel Press Regulator Solenoid Supply Voltage Control Circuit High	P00CA	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the Fuel Press Regulator Solenoid Supply Voltage Control short to power		Engine Speed Run/Crank Voltage	≥ 50 RPM 11 ≤ Volts ≤ 32 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	1 trips Type A
Mass Air Flow System Performance (naturally aspirated)	P0101	Determines if the MAF sensor is stuck within the normal operating range	Filtered Throttle Model Error AND ABS(Measured Flow – Modeled Air Flow) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	≤ 300 kPa*(g/s) > 17 grams/sec > 25.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together)	≥ 400 RPM ≤ 6600 RPM ≥ 70 Deg C ≤ 125 Deg C ≥ -20 Deg C ≤ 125 Deg C ≥ 0.19	Continuous Calculation are performed every 12.5 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						Filtered Throttle Model Error multiplied by TPS Residual Weight Factor based on RPM Modeled Air Flow multiplied by MAF Residual Weight Factor based on RPM and MAF Residual Weight Factor Based on MAF Estimate MAP Model 2 multiplied by MAP2 Residual Weight Factor based on RPM See table "IFRD Residual Weighting Factors".		
					No Active DTCs:	MAP_SensorCircuitFA EGRValve_FP EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA ECT_Sensor_Ckt_FP IAT_SensorFA IAT_SensorCircuitFP		
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	≤ 300 Hertz (~ 0.25 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> 1.0 seconds ≥ 300 RPM ≥ 11.0 Volts ≥ 1.0 seconds	200 failures out of 250 samples 1 sample every cylinder firing event	Type B 2 trips
Mass Air Flow Sensor Circuit High Frequency	P0103	Detects a high frequency output from the MAF sensor	MAF Output	≥ 11000 Hertz (~ 328 gm/sec)	Engine Run Time Engine Speed Ignition Voltage	> 1.0 seconds ≥ 300 RPM ≥ 11.0 Volts	200 failures out of 250 samples	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Above criteria present for a period of time	≥ 1.0 seconds	1 sample every cylinder firing event	
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	≤ 300 kPa*(g/s) > 25.0 kPa > 25.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) No Active DTCs:	≥ 400 RPM ≤ 6600 RPM ≥ 70 Deg C ≤ 125 Deg C ≥ -20 Deg C ≤ 125 Deg C ≥ 0.19 Filtered Throttle Model Error multiplied by TPS Residual Weight Factor based on RPM MAP Model 1 multiplied by MAP1 Residual Weight Factor based on RPM MAP Model 2 multiplied by MAP2 Residual Weight Factor based on RPM See table "IFRD Residual Weighting Factors". MAP_SensorCircuitFA EGRValve_FP EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA	Continuous Calculations are performed every 12.5 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			<u>Engine Not Rotating Case:</u> Manifold Pressure OR Manifold Pressure	 < 50.0 kPa > 105.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	ECT_Sensor_Ckt_FP IAT_SensorFA IAT_SensorCircuitFP > 10.0 seconds EngModeNotRunTmErr MAP_SensorFA AAP_SnsrFA_NA MAP_SensorCircuitFP AAP_SnsrCktFP_NA	999 failures out of 5 samples 1 sample every 12.5 msec	
Manifold Absolute Pressure Sensor Circuit Low	P0107	Detects a continuous short to low or open in either the signal circuit or the MAP sensor.	MAP Voltage	< 3.0 % of 5 Volt Range (0.15 Volts = 3.5 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type B 2 trips
Manifold Absolute Pressure Sensor Circuit High	P0108	Detects an open sensor ground or continuous short to high in either the signal circuit or the MAP sensor.	MAP Voltage	> 90.0 % of 5 Volt Range (4.50 Volts = 115.0 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type B 2 trips
Intake Air Temperature Sensor Circuit Low (High Temperature)	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	> 0.0 seconds	50 failures out of 63 samples 1 sample every 100 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Intake Air Temperature Sensor Circuit High (Low Temperature)	P0113	Detects a continuous open circuit in the IAT signal circuit or the IAT sensor	Raw IAT Input	> 142438 Ohms (~-60 deg C)	Engine Run Time	> 0.0 seconds	50 failures out of 63 samples 1 sample every 100 msec	Type B 2 trips
Intake Air Temperature Sensor Intermittent In-Range	P0114	Detects a noisy or erratic IAT signal circuit or IAT sensor	Change in IAT reading between consecutive 100 millisecond samples Change in IAT is multiplied by IAT Intermittent Weight Factor based on Filtered IAT. Filtered IAT = 0.10 * Current IAT + 0.90 * Filtered IAT from 100 milliseconds before	> 10 DegC	Continuous		20 failures out of 200 samples 1 sample every 100 msec	Type B 2 trips
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 25200 second soak (fast fail). 2) ECT at power up > IAT at power up by 15.8 C after a minimum 25200 second soak and a block heater has not been detected.	See "P0116: Fail if power up ECT exceeds IAT by these values" in the Supporting tables section	No Active DTC's Non-volatile memory initialization Test complete this trip Test aborted this trip IAT LowFuelCondition Diag **Block Heater detection is enabled when either of the following occurs:**	VehicleSpeedSensor_F IAT_SensorFA ECT_Sensor_Ckt_FA IgnitionOffTimeValid TimeSinceEngineRunningValid = Not occurred = False = False ≥ -7 ºC = False	1 failure 500 msec/sample Once per valid cold start	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			3) ECT at power up > IAT at power up by 15.8 C after a minimum 25200 seconds soak and the time spent cranking the engine without starting is greater than 10.0 seconds with the LowFuelConditionDiag	= False	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. Diagnostic is aborted when 3) or 4) occurs:** 1a) Vehicle drive time 1b) Vehicle speed 1c) Additional Vehicle drive time is provided to 1a when Vehicle speed is below 1b as follows: 1d) IAT drops from power up IAT 2a) ECT drops from power up ECT 2b) Engine run time 3) Engine run time with vehicle speed below 1b 4) Minimum IAT during test	> 15.8 ºC < 10.0 Seconds > 400 Seconds with > 14.9 MPH 0.50 times the seconds with vehicle speed below 1b ≥ 5.3 ºC > 5 ºC Within > 60 Seconds > 1800 Seconds ≤ -7 ºC		
Engine Coolant Temp Sensor Circuit Low	P0117	This DTC detects a short to ground in the ECT signal circuit or the ECT sensor.	ECT Resistance (@ 150ºC)	< 47 Ohms			5 failures out of 6 samples 1 sec/sample Continuous	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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)	> 320000 Ohms	Or IAT min	> 10.0 seconds ≥ 0.0 °C	5 failures out of 6 samples 1 sec/sample Continuous	2 trips Type B
Throttle Position Sensor Performance	P0121	Determines if the Throttle Position Sensor input is stuck within the normal operating range	Filtered Throttle Model Error Error AND ABS(Measured Flow – Modeled Air Flow) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	> 300 kPa*(g/s) > 17 grams/sec ≤ 25.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) No Active DTCs:	≥ 400 RPM ≤ 6600 RPM > 70 Deg C < 125 Deg C > -20 Deg C < 125 Deg C ≥ 0.19 Filtered Throttle Model Error Error multiplied by TPS Residual Weight Factor based on RPM Modeled Air Flow Error multiplied by MAF Residual Weight Factor based on RPM and MAF Residual Weight Factor Based on MAF Est See table "IFRD Residual Weighting Factors". MAP_SensorCircuitFA EGRValve_FP EGRValvePerformance_FA	Continuous Calculation are performed every 12.5 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA ECT_Sensor_Ckt_FP IAT_SensorFA IAT_SensorCircuitFP		
TPS1 Circuit Low	P0122	Detects a continuous or intermittent short or open in TPS1 circuit	TPS1 Voltage <	0.325 Volts		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 (P06A3) 5V reference circuit	79/159 counts; 57 counts continuous; 3.125 msec /count in the ECM main processor	Type: A MIL: YES Trips: 1
TPS1 Circuit High	P0123	Detects a continuous or intermittent short or open in TPS1 circuit	TPS1 Voltage >	4.75 Volts		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 (P06A3) 5V reference circuit	79/159 counts; 57 counts continuous; 3.125 msec /count in the ECM main processor	Type: A MIL: YES Trips: 1
Engine Coolant Temperature Below Stat Regulating Temperature	P0128	This DTC detects if the engine coolant temperature rises too slowly due to an ECT or Cooling system fault	Actual accumulated airflow is > predicted accumulated airflow before:	See “P0128: Maximum Accumulated Airflow for IAT and Start-up ECT conditions“ in the Supporting tables section	No Active DTC's	MAP_SensorFA MAF_SensorFA TPS_Performance_FA TPS_FA	30 failures to set DTC 1 sec/sample	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Range #1 (Primary) ECT reaches 71.0 °C when IAT min is < 52.0°C and ≥ 10.0°C.			TPS_ThrottleAuthorityDefaulted IAT_SensorFA ECT_Sensor_Ckt_FA ECT_Sensor_Perf_FA VehicleSpeedSensor_FA	Once per ignition key cycle	
			Range #2 (Alternate) ECT reaches 71.0 °C when IAT min is < 10.0°C and ≥ -7.0°C.		Engine not run time Engine run time Fuel Condition	≥ 1800 seconds ≥ 30 seconds Ethanol ≤ 87%		
					Range #1 (Primary) Test ECT at start run Average Airflow Vehicle speed	≤ 66.0 °C ≥ 1.0 gps > 5 mph for at least 0.5 miles		
					Range #2 (Alternate) Test ECT at start run Average Airflow Vehicle speed	≤ 66.0 °C ≥ 1.0 gps > 5 mph for at least 0.5 miles		
					Accumulated Airflow Adjustments 1) Max. airflow amount added when accumulating airflow is 2) Zero Airflow accumulated when airflow is 3) With AFM active Airflow added to accumulated is multiplied by 4) With Decel Fuel Cut Off active, accumulated airflow is reduced by multiplying actual airflow by 5) With Hybrid Engine Off Active accumulated Airflow is reduced by	30.0 gps < 2.0 gps 50.00% 1.00 times 1.00 grams each second		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Diagnostic will restart (using the lower value) if ECT drops	≥ 100.0°C below previous min ECT		
O2S Circuit Low Voltage Bank 1 Sensor 1	P0131	This DTC determines if the O2 sensor circuit is shorted to low.	Measure Oxygen Sensor Signal.	Oxygen Sensor signal is < 50 mvolts	No Active DTC's	TPS_ThrottleAuthority Defaulted MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA	380 failures out of 475 samples Frequency: Continuous in 100 milli - second loop	2 trips Type B
					AIR intrusive test	= Not active		
					Fuel intrusive test	= Not active		
					Idle intrusive test	= Not active		
					EGR intrusive test	= Not active		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 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 ≤ 1.0137		
					Air Per Cylinder	50 ≤ APC ≤ 500 mgrams		
					Fuel Control State	= Closed Loop		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Closed Loop Active	= TRUE		
					All Fuel Injectors for active Cylinders	Enabled (On)		
					Fuel Condition	Ethanol ≤ 87%		
					Fuel State	DFCO not active		
					All of the above met for Time	> 5.0 seconds		
O2S Circuit High Voltage Bank 1 Sensor 1	P0132	This DTC determines if the O2 sensor circuit is shorted to high.	Measure Oxygen Sensor Signal.	Oxygen Sensor signal is > 1050 mvolts	**Open Test Criteria**		100 failures out of 125 samples	2 trips Type B
					No Active DTC's	TPS_ThrottleAuthority Defaulted		
						MAF_SensorFA		
						EthanolCompositionSensor_FA	Frequency: Continuous in 100 milli - second loop	
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts		
					AFM Status	= All Cylinders active		
					Heater Warm-up delay	= Complete		
					Engine Run Time	> 5 seconds		
					Engine Run Accum	> 120 seconds		
					Fuel Condition	≤ 87 % Ethanol		
					No Active DTC's	MAP_SensorFA		
						EvapPurgeSolenoidCircuit_FA		
						EvapFlowDuringNonPurge_FA		
						EvapVentSolenoidCircuit_FA		
						EvapSmallLeak_FA		
						EvapEmissionSystem_FA		
						FuelTankPressureSnsrCkt_FA		
						FuelInjectorCircuit_FA		
						AIR System FA		
					Low Fuel Condition Diag	= False		
					Fuel Condition	≤ 87 % Ethanol		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Initial delay after Open Test Criteria met (cold start condition)	> 45.0 seconds when engine soak time > 28800 seconds		
					Initial delay after Open Test Criteria met (not cold start condition)	> 45.0 seconds when engine soak time ≤ 28800 seconds		
					Equivalence Ratio	0.9912 ≤ equiv. ratio ≤ 1.0137		
					Air Per Cylinder	50 ≤ APC ≤ 500 mgrams		
					Fuel Control State	not = Power Enrichment		
					All of the above met for Time	> 5 seconds		
O2S Slow Response Bank 1 Sensor 1	P0133	This DTC determines if the O2 sensor response time is degraded.	The average response time is calculated over the test time, and compared to the threshold. Refer to **"P0133 - O2S Slow Response Bank 1 Sensor 1"** Pass/Fail Threshold table in the Supporting Tables tab.		No Active DTC's	TPS_ThrottleAuthority Defaulted MAP_SensorFA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault_No Snsr MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsr Ckt_FA FuelInjectorCircuit_FA AIR System FA	Sample time is 60 seconds Frequency: Once per trip Green Sensor Delay Criteria The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously.	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						EthanolCompositionSensor_FA	(Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
						EngineMisfireDetected_FA		
					Bank 1 Sensor 1 DTC's not active	= P0131, P0132 or P01		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 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		
					Green O2S Condition	= Not Valid		
					O2 Heater on for	≥ 40 seconds		
					Learned Htr resistance	= Valid		
					Engine Coolant	> 70 ºC		
					IAT	> -40 ºC		
					Engine run Accum	> 120 seconds		
					Time since any AFM status change	> 2.0 seconds		
					Time since Purge On to Off change	> 0.0 seconds		
					Time since Purge Off to On change	> 1.5 seconds		
					Purge duty cycle	≥ 0 % duty cycle		
					Engine airflow	14 gps ≤ engine airflow ≤ 40 gps		
					Engine speed	1000 ≤ RPM ≤ 3500		
					Fuel	< 87 % Ethanol		
					Baro	> 70 kpa		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Air Per Cylinder	≥ 215 mGrams		
					Low Fuel Condition Diag	= False		
					Fuel Control State	= Closed Loop		
					Closed Loop Active	= TRUE		
					LTM fuel cell	= Enabled		
					Transient Fuel Mass	≤ 100.0 mgrams		
					Baro	= Not Defaulted		
					Fuel Control State	not = Power Enrichment		
					Fuel State	DFCO not active		
					Commanded Proportional Gain	≥ 0.0 %		
					All of the above met for Time	> 3.0 seconds		
O2S Circuit Insufficient Activity Bank 1 Sensor 1	P0134	This DTC determines if the O2 sensor circuit is open.	Measure Oxygen Sensor Signal.	1700 mvolts < Oxygen Sensor signal	No Active DTC's	TPS_ThrottleAuthority Defaulted MAF_SensorFA EthanolCompositionSensor_FA	400 failures out of 500 samples. Frequency: Continuous	2 trips Type B
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts		
					AFM Status	= All Cylinders active	100msec loop	
					Heater Warm-up delay	= Complete		
					Engine Run Time	> 5 seconds		
					Engine Run Accum	> 120 seconds		
					Fuel	≤ 87 % Ethanol		
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.	Measured Heater Current.	Measured Heater current < 0.3 amps -OR- Measured Heater current > 2.5 amps	No Active DTC's	ECT_Sensor_FA	8 failures out of 10 samples	2 trips Type B
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts	Frequency: 2 tests per trip	
					Heater Warm-up delay	= Complete		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					O2S Heater device control	= Not active	30 seconds delay between tests and 1 second execution rate	
					B1S1 O2S Heater Duty Cycle	> zero		
					All of the above met for Time	> 120 seconds		
O2S Circuit Low Voltage Bank 1 Sensor 2	P0137	This DTC determines if the O2 sensor circuit is shorted to low.	Measure Oxygen Sensor Signal.	Oxygen Sensor signal is < 50 mvolts	No Active DTC's	TPS_ThrottleAuthority Defaulted	430 failures out of 540 samples	2 trips Type B
						MAP_SensorFA		
						AIR System FA		
						Ethanol Composition Sensor FA	Frequency: Continuous in 100 milli - second loop	
						EvapPurgeSolenoidCircuit_FA		
						EvapFlowDuringNonPurge_FA		
						EvapVentSolenoidCircuit_FA		
						EvapSmallLeak_FA		
						EvapEmissionSystem_FA		
						FuelTankPressureSnsrCkt_FA		
						FuelInjectorCircuit_FA		
					AIR intrusive test	= Not active		
					Fuel intrusive test	= Not active		
					Idle intrusive test	= Not active		
					EGR intrusive test	= Not active		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 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 ≤ 1.0137		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Air Per Cylinder	50 ≤ APC ≤ 500 mgrams		
					Fuel Control State	= Closed Loop		
					Closed Loop Active	= TRUE		
					All Fuel Injectors for active Cylinders	Enabled (On)		
					Fuel Condition	Ethanol ≤ 87%		
					Fuel State	DFCO not active		
					All of the above met for Time	> 5.0 seconds		
O2S Circuit High Voltage Bank 1 Sensor 2	P0138	This DTC determines if the O2 sensor circuit is shorted to high.	Measure Oxygen Sensor Signal.	Oxygen Sensor signal is > 1050 mvolts	**Open Test Criteria**		100 failures out of 125 samples	2 trips Type B
					No Active DTC's	TPS_ThrottleAuthority Defaulted		
						MAF_SensorFA		
						EthanolCompositionSensor_FA	Frequency: Continuous in 100 milli - second loop	
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts		
					AFM Status	= All Cylinders active		
					Heater Warm-up delay	= Complete		
					Engine Run Time	> 5 seconds		
					Engine Run Accum	> 120 seconds		
					Fuel Condition	≤ 87 % Ethanol		
					No Active DTC's	MAP_SensorFA		
						EvapPurgeSolenoidCircuit_FA		
						EvapFlowDuringNonPurge_FA		
						EvapVentSolenoidCircuit_FA		
						EvapSmallLeak_FA		
						EvapEmissionSystem_FA		
						FuelTankPressureSnsrCkt_FA		
						FuelInjectorCircuit_FA		
						AIR System FA		
					Low Fuel Condition Diag	= False		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Fuel Condition	≤ 87 % Ethanol		
					Initial delay after Open Test Criteria met (cold start condition)	> 45.0 seconds when engine soak time > 28800 seconds		
					Initial delay after Open Test Criteria met (not cold start condition)	> 45.0 seconds when engine soak time ≤ 28800 seconds		
					Equivalence Ratio	0.9912 ≤ equiv. ratio ≤ 1.0137		
					Air Per Cylinder	50 ≤ APC ≤ 500 mgrams		
					Fuel Control State	not = Power Enrichment		
					All of the above met for Time	> 5 seconds		
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 is greater than the threshold. OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds) is greater than the airflow threshold.	1) B1S2 EWMA normalized integral value > 8.0 units OR 2) Accumulated air flow during slow rich to lean test > 43 grams (upper threshold is 450 mvolts and lower threshold is 150 mvolts)	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = TRUE, multiple tests per trip are allowed	1 trips Type A EWMA
					B1S2 Failed this key cycle	P013B, P013E, P013F, P2270 or P2271		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell DTC's Passed DTC's Passed	= Not Valid = Not Valid = False = enabled = P2270 (and P2272 (if applicable)) = P013E (and P014A (if applicable))	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).			
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 is greater than the threshold. OR The Accumulated mass air flow monitored during the Slow Response Test (between the lower and upper voltage thresholds) is greater than the airflow threshold.	1) B1S2 EWMA normalized integral value > 8.0 units OR 2) Accumulated air flow during slow lean to rich test > 108 grams (lower threshold is 300 mvolts and upper threshold is 600 mvolts)	No Active DTC's B1S2 Failed this key cycle	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013A, P013E, P013F, P2270 or P2271 10.0 volts < Run/Crank Voltage< 32.0 volts	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	1 trips Type A EWMA

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Run/Crank Voltage Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell DTC's Passed DTC's Passed DTC's Passed DTC's Passed DTC's Passed	= Valid = Not Valid = Not Valid = False = enabled = P2270 (and P2272 (if applicable)) = P013E (and P014A (if applicable)) = P013A (and P013C (if applicable)) = P2271 (and P2273 (if applicable)) = P013F (and P014B (if applicable))	Green Sensor Delay Criteria The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					After above conditions are met: Fuel Enrich mode continued.			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 cannot go below the threshold voltage. AND The Accumulated mass air flow monitored during the Delayed Response Test is greater than the threshold.	1) Post O2S signal > 450 mvolts AND 2) Accumulated air flow during stuck rich test > 40 grams.	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	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	2 trips Type B
					B1S2 Failed this key cycle	P013A, P013B, P013F, P2270 or P2271		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts		
							Green Sensor Delay Criteria	
					Learned heater resistance	= Valid	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					ICAT MAT Burnoff delay	= Not Valid		
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Post fuel cell	= enabled		
					DTC's Passed	= P2270 and P2272 (if applicable)		
					After above conditions are met: DFCO mode entered (wo driver initiated pedal input).			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL 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 cannot go above the threshold voltage. AND The Accumulated mass air flow monitored during the Delayed Response Test is greater than the threshold.	1) Post O2S signal < 300 mvolts AND 2) Accumulated air flow during lean to rich test > 100 grams.	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	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	2 trips Type B
					B1S2 Failed this key cycle	P013A, P013B, P013E, P2270 or P2271		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts		
							Green Sensor Delay Criteria	
					Learned heater resistance	= Valid	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					ICAT MAT Burnoff delay	= Not Valid		
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Post fuel cell	= enabled		
					DTC's Passed	= P2270 (and P2272 (if applicable))		
					DTC's Passed	= P013E (and P014A (if applicable))		
					DTC's Passed	= P013A (and P013C (if applicable))		
					DTC's Passed	= P2271 (and P2273 (if applicable))		
					After above conditions are met: Fuel Enrich mode entered.			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2S Circuit Insufficient Activity Bank 1 Sensor 2	P0140	This DTC determines if the O2 sensor circuit is open.	Measure Oxygen Sensor Signal.	1700 mvolts < Oxygen Sensor signal	No Active DTC's Run/Crank Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel	TPS_ThrottleAuthority Defaulted MAF_SensorFA EthanolCompositionSensor_FA 10.0 volts < Run/Crank Voltage< 32.0 volts = All Cylinders active = Complete > 5 seconds > 120 seconds ≤ 87 % Ethanol	1175 failures out of 1225 samples. Frequency: Continuous 100msec loop	2 trips Type B
O2S Heater Performance Bank 1 Sensor 2	P0141	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	Measured Heater Current.	Measured Heater current < 0.3 amps -OR- Measured Heater current > 2.5 amps	No Active DTC's Run/Crank Voltage Heater Warm-up delay O2S Heater device control B1S1 O2S Heater Duty Cycle **All of the above met for** Time	ECT_Sensor_FA 10.0 volts < Run/Crank Voltage< 32.0 volts = Complete = Not active > zero > 120 seconds	8 failures out of 10 samples Frequency: 2 tests per trip 30 seconds delay between tests and 1 second execution rate	2 trips Type B
Fuel System Too Lean Bank 1	P0171	Determines if the fuel control system is in a lean condition, based on the filtered long-term fuel trim.	The filtered long-term fuel trim metric	≥ 1.285	Engine speed BARO Coolant Temp MAP Inlet Air Temp MAF Fuel Level	400 <rpm< 6600 > 70 kPa -38 <°C< 130 15 <kPa< 255 -20 <°C< 150 1.0 <g/s< 512.0 > 10 % or if fuel sender is faulty	> 100 ms Frequency: Continuous Development data indicates that the Fuel Adjustment System Diagnostic (FASD) is typically enabled during **71.2** % of the EPAIII drive cycle. This is also typical of real-world driving, however values will vary (higher or lower) based on the	Type B 2 Trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Long Fuel Trim data accumulation:	> 44.0 seconds of data must accumulate on each trip, with at least 14.0 seconds of data in the current fuel trim cell before a pass or fail decision can be made.	actual conditions present during the drive cycle.	
					Long-Term Fuel Trim Cell Usage Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control or diagnosis. **Please see "Supporting Tables" Tab for a list of cells utilized for diagnosis.**			
					Closed Loop fueling enabled Closed Loop fueling is enabled as a function of Time based on Start-up coolant temp. **Please see "Supporting Tables" Tab**			
					Long Fuel Trim enabled	Closed Loop Enabled and coolant temp > 40 and < 120		
					EGR Flow Diag. Intrusive Test Not Active Catalyst Monitor Diag. Intrusive Test Not Active Post O2 Diag. Intrusive Test Not Active Device Control Not Active EVAP Diag. “tank pull down” Not Active fuel trim diagnosed during decels? No			
					No active DTCs:	IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR System FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSensorCircuit_FA Ethanol Composition Sensor FA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						FuelInjectorCircuit_FA EngineMisfireDetected_FA EGRValvePerformance_FA EGRValveCircuit_FA MAP_EngineVacuumStatus AmbientAirDefault_NA		
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 different, yet related tests that are used to determine a Rich fault. They are Passive and Intrusive and are described below:			BARO Coolant Temp MAP IAT MAF	> 70 kPa -38 <°C< 130 15 <kPa< 255 -20 <°C< 150 1.0 <g/s< 512.0	> 100 ms Frequency: Continuous Development data indicates that the Fuel Adjustment System Diagnostic (FASD) is typically enabled during 71.2 % of the EPAIII drive cycle. This is also typical of real-world driving, however values will vary (higher or lower) based on the actual conditions present during the drive cycle.	Type B 2 Trip(s)
					Long Fuel Trim data accumulation:	> 44.0 seconds of data must accumulate on each trip, with at least 14.0 seconds of data in the current fuel trim cell before a pass or fail decision can be made.		
					Long-Term Fuel Trim Cell Usage Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control or diagnosis. **Please see "Supporting Tables" Tab for a list of cells utilized for diagnosis.**			
					Closed Loop fueling enabled Closed Loop fueling is enabled as a function of Time based on Start-up coolant temp. **Please see "Supporting Tables" Tab**			
					Long Fuel Trim enabled	Closed Loop Enabled and coolant temp > 40 and < 120		
		Passive Test: Non-purge cells are monitored to determine if a rich condition exists.	The filtered Non-Purge Long Term Fuel Trim metric	≤ 0.760				
		Intrusive Test- When the filtered Purge Long Term Fuel Trim metric is ≤ 0.770, purge is ramped off to determine if excess purge vapor is the cause of the Rich condition. If the filtered Purge Long Term	If the filtered Purge Long Term Fuel Trim metric AND The filtered Non-Purge Long Term Fuel Trim metric	≤ 0.770 ≤ 0.760	A Passive Test decision cannot be made when Purge is enabled.	Fail determinations require that the Malfunction Criteria be satisfied for 2 out of 3 intrusive segments.		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		Fuel Trim metric > 0.770, the test passes without checking the filtered Non-Purge Long Term Fuel Trim metric.	Segment Definition - Segments can last up to 35, and are separated by the lesser of 30 seconds of purge-on time or enough time to purge 18 grams of vapor. A maximum of 3 completed segments or 30 intrusive 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-on Long Term fuel trim > Purge Rich Limit Table for at least 60 seconds, indicating that the canister has been purged. Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions, and the execution frequency of other diagnostics.					
					EGR Flow Diag. Intrusive Test Not Active Catalyst Monitor Diag. Intrusive Test Not Active Post O2 Diag. Intrusive Test Not Active Device Control Not Active EVAP Diag. “tank pull down” Not Active fuel trim diagnosed during decels? No			
					No active DTCs:	IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR System FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSensorCircuit_FA Ethanol Composition Sensor FA FuelInjectorCircuit_FA EngineMisfireDetected_FA EGRValvePerformance_FA EGRValveCircuit_FA MAP_EngineVacuumStatus AmbientAirDefault_NA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
SIDI High Pressure Sensor Performance	P0191	This DTC detects a skewed fuel rail sensor via a comparison of measured pressure and commanded/ modeled pressure				Enabled when a code clear is not active or not exiting device control Engine is not cranking		1 trips Type A
			High Drive Test (Relief Pressure - Measured high Pressure)	Enabled ≤ -3.00 MPa	Engine Speed Desired High Side Pressure Vehicle Speed Run/Crank Voltage Low Pressure Fuel Pump Pressure Engine Run Time	1000 ≤ RPM ≤ 2000 7 ≤ MPa ≤ 9 ≥ 27.96 MPH 11 ≤ Volts ≤ 32 ≥ 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	High Drive Test ≥ 240 counts (12.5ms per count)	
			Low Drive Test (Commanded high Pressure - Measured high Pressure) AND Modeled Injection Pressure	Enabled ≥ 0.900 MPa ≥ 2.00 MPa	Engine Speed Desired High Side Pressure Vehicle Speed Run/Crank Voltage Low Pressure Fuel Pump Pressure Engine Run Time	1000 ≤ RPM ≤ 2000 7.00 ≤ MPa ≤ 9.00 ≥ 27.96 MPH 11 ≤ Volts ≤ 32 ≥ 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	LoDrive Test ≥ 240 counts (12.5ms per count)	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Sensor Stuck Test Measured High Pressure (max - min)	Enabled ≤ 0.100 MPa	Engine Speed Vehicle Speed	≥ 2000 ≥ 18.64 MPH Enabled when a code clear is not active or not exiting device control Engine is not cranking	Stuck Test Engine Run Time ≥ KtFHPD_t_PumpCntrlEngRunThrsh(See Supporting Tables) or Accumulating engine crank time ≥ KtFHPD_t_SnsPrfStuckCrankTmout(See Supporting Tables)	
						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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						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 Fuel InjCkt Not (FA or TFTKO) EST Driver Not(FA) Misfire detected Not(FA) MAFR sensor Not(FA) MAPR sensor Not(FA) APSR Pedal sensor Not(FA) TPSR sensor Not(FA) VSPR speed sensor Not(FA) SystemRPM Not (FA) Manual Clutch not engaged or vehicle has automatic transmission All cylinder are fuel enabled		
High Pressure Sensor Out of Range Low	P0192	This DTC checks the circuit for electrical integrity during operation.	High Pressure Fuel Sensor	≤ 5 % of 5Vref	Run/Crank Voltage	11 ≤ Volts ≤ 32 Engine Running	Both Run Continuously Engine Synchronous Mode 800 failures out of 1000 samples Time Based Mode 400 failures out of 500 samples 6.25 ms Sample Continuous	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
High Pressure Sensor Out of Range High	P0193	This DTC checks the circuit for electrical integrity during operation.	High Pressure Fuel Sensor	≥ 95 % of 5Vref	Run/Crank Voltage	11 ≤ Volts ≤ 32 Engine Running	Both Run Continuously Engine Synchronous Mode 800 failures out of 1000 samples Time Based Mode 400 failures out of 500 samples 6.25 ms Sample Continuous	1 trips Type A
Injector 1 Open Circuit	P0201	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector has determined to be an open circuit		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 2 Open Circuit	P0202	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector 2 has determined to be an open circuit		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 3 Open Circuit	P0203	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector has determined to be an open circuit		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 4 Open Circuit	P0204	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector has determined to be an open circuit		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
TPS2 Circuit Low	P0222	Detects a continuous or intermittent short or open in TPS2 circuit	TPS2 Voltage <	0.25		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 (P06A3) 5V reference circuit	79/159 counts; 57 counts continuous; 3.125 msec /count in the ECM main processor	Type: A MIL: YES Trips: 1

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 >	4.59		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 (P06A3) 5V reference circuit	79/159 counts; 57 counts continuous; 3.125 msec /count in the ECM main processor	Type: A MIL: YES Trips: 1
Injector 1 Low side circuit shorted to ground	P0261	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector low side is shorted to ground		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 1 Low side circuit shorted to power	P0262	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector low side is shorted to power		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 2 Low side circuit shorted to ground	P0264	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector 2 low side is shorted to ground		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 2 Low side circuit shorted to power	P0265	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector low side is shorted to power		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 3 Low side circuit shorted to ground	P0267	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector low side is shorted to ground		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 3 Low side circuit shorted to power	P0268	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector low side is shorted to power		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 4 Low side circuit shorted to ground	P0270	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector low side is shorted to ground		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Injector 4 Low side circuit shorted to power	P0271	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector low side is shorted to power		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Random Misfire Detected Cylinder 1 Misfire Detected Cylinder 2 Misfire Detected Cylinder 3 Misfire Detected Cylinder 4 Misfire Detected	P0300 P0301 P0302 P0303 P0304	These DTC's will determine if a random or a cylinder specific misfire is occurring by monitoring crankshaft velocity	Deceleration index vs. Engine Speed Vs Engine load Deceleration index calculation is tailored to specific veh. 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.	**(>**Idle SCD AND > Idle SCD ddt Tables) **OR** (>SCD Delta AND > SCD Delta ddt Tables) **OR** (>Idle Cyl Mode AND > Idle Cyl Mode ddt Tables) **OR** (>Cyl Mode AND > Cyl Mode ddt Tables) **OR** (>Rev Mode Table) **OR** (> AFM Table in Cyl Deact mode)	Engine Run Time ECT If ECT at startup ECT Run/Crank Voltage + Throttle delta - Throttle delta	> 2 crankshaft revolutions -7ºC < ECT < 125ºC < -7ºC 21ºC < ECT < 125ºC 9.00<volts<32.00 < 95.00% per 25 ms < 95.00% per 25 ms	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. any Catalyst Exceedence = (1) 200 rev block as data supports for catalyst damage. Failure reported with (1 or 3) Exceedences in FTP, or (1) Exceedence outside FTP. Continuous	2 Trips Type B (Mil Flashes with Catalyst Damaging Misfire)
			Misfire Percent Emission Failure Threshold Misfire Percent Catalyst Damage Engine Speed Engine Load Misfire counts (at low speed/loads, one cylinder may not cause cat damage)	≥ 1.00% P0300 ≥ 1.00% emission >"Catalyst Damaging Misfire Percentage" Table: **Unless** ≤ 1000 rpm AND ≤ 20% load AND ≥ 180 counts on one cylinder				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Speed	425 < rpm < 6600 Engine speed limit is a function of inputs like Gear and temperature typical Engine Speed Limit = 7000 rpm	4 cycle delay	
				disable conditions:	No active DTCs:	TPS_FA EnginePowerLimited MAF_SensorTFTKO MAP_SensorTFTKO IAT_SensorTFTKO ECT_Sensor_Ckt_TFTKO 5VoltReferenceB_FA CrankSensorTestFailedTKO CrankSensorFaultActive CrankIntakeCamCorrelationFA CrankExhaustCamCorrelationFA CrankCamCorrelationTFTKO AnyCamPhaser_FA AnyCamPhaser_TFTKO	4 cycle delay	
					P0315 & engine speed	> 1000 rpm		
					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	4 cycle delay	
					Fuel System Status Active Fuel Management	≠ Fuel Cut Transition in progress	4 cycle delay 0 cycle delay	
					Undetectable engine speed and engine load region	invalid speed load range in **decel index** tables	4 cycle delay	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Abusive Engine Over Speed	> 8192 rpm	0 cycle delay	
					Below zero torque (except CARB approved 3000 rpm to redline triangle.)	<" Zero torque engine load" in Supporting Tables tab	4 cycle delay	
					Below zero torque: TPS Veh Speed	 ≤ 1% > 29.8 MPH	4 cycle delay	
					EGR Intrusive test	Active	12 cycle delay	
					Manual Trans Throttle Position AND Automatic transmission shift	Clutch shift > 200.00%	4 cycle delay 0 cycle delay	
					Driveline Ring Filter active After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.			
					Filter Driveline ring: Stop filter early:	 7 engine cycles after misfire 3 Engine cycles after misfire		
					Abnormal engine speed oscillations: (Rough road etc) Off Idle, number of consecutive decelerating cylinders after accelerating,: (Number of decels can vary with misfire detection equation) TPS Engine Speed Veh Speed			
					SCD Cyl Mode Rev Mode	> 3 % > 1000 rpm > 3.1 mph		
						= 4 consecutive cyls = 2 consecutive cyls = 2 consecutive cyls		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Crankshaft Position System Variation Not Learned	P0315	Monitor for valid crankshaft error compensation factors	Sum of Compensation factors	≥ 2.0040 OR ≤ 1.9960	OBD Manufacturer Enable Counter	0	0.50 seconds Frequency Continuous 100 msec	1 Trips Type A
Knock Sensor (KS) Performance Per Cylinder	P0324	This diagnostic checks for knock sensor performance out of the normal expected range due to excessive knock **or** abnormal engine noise on a per cylinder basis			Diagnostic Enabled (1 = Enabled) Engine Speed Engine Air Flow ECT IAT	= 1 ≤ 8500 RPM ≥ 40 mg/cylinder and ≤ 2000 mg/cylinder ≥ -40 deg's C ≥ -40 deg's C	First Order Lag Filter with Weight Coefficient	Type: B MIL: YES Trips: 2
			Filtered Knock Intensity (for Excessive Knock) VaKNKD_k_PerfCylKnockIntFilt	> 0.5000	Engine Speed	≥ 400 RPM	Weight Coefficient = 0.0400	
			Filtered FFT Intensity: (for Abnormal Noise) VaKNKD_k_PerfCylAbnFiltIntnsity	< Abnormal Noise Threshold (see supporting tables)	Engine Speed	≥ 400 RPM	Weight Coefficient = 0.0100	
							Updated each engine event Max time to set = 10 seconds	
Knock Sensor (KS) Circuit Bank 1	P0325	This diagnostic checks for an open in the knock sensor circuit	Filtered FFT Output (VaKNKD_k_OpenFiltIntensity[0])	> OpenCktThrshMin **and** < OpenCktThrshMax	Diagnostic Enabled (1 = Enabled) Engine Speed Engine Air Flow	= 1 ≥ 400 RPM and ≤ 8500 RPM ≥ 40 mg/cylinder and ≤ 2000 mg/cylinder	First Order Lag Filter with Weight Coefficient	Type: B MIL: YES Trips: 2

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							Weight Coefficient = 0.0100	
					ECT	≥ -40 deg's C		
					IAT	≥ -40 deg's C	100 msec rate	
				See Supporting Tables for OpenCktThrshMin & Max			Updated each engine event	
							Max time to set = 10 seconds	
Knock Sensor (KS) Performance Bank 1	P0326	This diagnostic checks for knock sensor performance out of the normal expected range due to excessive knock **or** abnormal engine noise on a per bank basis			Diagnostic Enabled (1 = Enabled)	= 1	First Order Lag Filter with Weight Coefficient	Type: B MIL: YES Trips: 2
					Engine Speed	≤ 8500 RPM		
					Engine Air Flow	≥ 40 mg/cylinder and ≤ 2000 mg/cylinder		
					ECT	≥ -40 deg's C		
					IAT	≥ -40 deg's C		
			Filtered Knock Intensity (for Excessive Knock) VaKNKD_k_PerfKnockIntFilt	> 0.3000	Engine Speed	≥ 400 RPM	Weight Coefficient = 0.0100	
			Filtered FFT Intensity: (for Abnormal Noise) VaKNKD_k_PerfAbnFiltIntnsity	< Abnormal Noise Threshold (see supporting tables)	Engine Speed	≥ 400 RPM	Weight Coefficient = 0.0100	
							Updated each engine event	
							Max time to set = 10 seconds	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 Signal Line	< 0.57 Volts	Diagnostic Enabled (1 = Enabled)	= 1	50 Failures out of 63 Samples	Type: B MIL: YES Trips: 2
					Engine Speed	> 0 RPM and < 8500 RPM	100 msec rate	
			or					
			Sensor Return Signal Line	< 0.40 Volts				
Knock Sensor (KS) Circuit High Bank 1	P0328	This diagnostic checks for an out of range high knock sensor signal	Sensor Input Signal Line	> 2.76 Volts	Diagnostic Enabled (1 = Enabled)	= 1	50 Failures out of 63 Samples	Type: B MIL: YES Trips: 2
					Engine Speed	> 0 RPM and < 8500 RPM	100 msec rate	
			or					
			Sensor Return Signal Line	> 1.95 Volts				
Crankshaft Position (CKP) Sensor A Circuit	P0335	Determines if a fault exists with the crank position sensor signal	<u>Engine-Cranking Crankshaft Test:</u>		<u>Engine-Cranking Crankshaft Test:</u>		<u>Engine-Cranking Crankshaft Test:</u>	Type B 2 trips
			Time since last crankshaft position sensor pulse received	≥ 4.0 seconds	Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	 = FALSE = FALSE = FALSE > 3.0 grams/second))	Continuous every 100 msec	
			<u>Time-Based Crankshaft Test:</u>		<u>Time-Based Crankshaft Test:</u>		<u>Time-Based Crankshaft Test:</u>	
			No crankshaft pulses received	≥ 1.0 seconds	Engine is Running Starter is not engaged		Continuous every 12.5 msec	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No DTC Active:	5VoltReferenceB_FA		
			Event-Based Crankshaft Test:		Event-Based Crankshaft Test:		Event-Based Crankshaft Test:	
			No crankshaft pulses received		Engine is Running		2 failures out of 10 samples	
					OR			
					Starter is engaged			
					No DTC Active:	5VoltReferenceA_FA		
						5VoltReferenceB_FA	One sample per engine revolution	
						P0365		
						P0366		
Crankshaft Position (CKP) Sensor A Performance	P0336	Determines if a performance fault exists with the crank position sensor signal	Crank Re-synchronization Test:		Crank Re-synchronization Test:		Crank Re-synchronization Test:	Type B 2 trips
			Time in which 20 or more crank re synchronizations occur	< 25.0 seconds	Engine Air Flow	≥ 3.0 grams/second	Continuous every 250 msec	
					Cam-based engine speed	> 450 RPM		
					No DTC Active:	5VoltReferenceB_FA		
						P0335		
			Time-Based Crankshaft Test:		Time-Based Crankshaft Test:		Time-Based Crankshaft Test:	
			No crankshaft synchronization gap found	≥ 0.4 seconds	Engine is Running		Continuous every 12.5 msec	
					Starter is not engaged			
					No DTC Active:	5VoltReferenceB_FA		
			Engine Start Test during Crank:		Engine Start Test during Crank:		Engine Start Test during Crank:	
			Time since starter engaged without detecting crankshaft synchronization gap		Starter engaged		Continuous every 100 msec	
					AND			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			[illegible]	≥ 1.5 seconds	(cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	 = FALSE = FALSE = FALSE > 3.0 grams/second		
			Event-Based Crankshaft Test: Crank Pulses received in one engine revolution OR Crank Pulses received in one engine revolution	 < 51 > 65	Event-Based Crankshaft Test: Engine is Running OR Starter is engaged No DTC Active:	 5VoltReferenceA_FA 5VoltReferenceB_FA P0365 P0366	Event-Based Crankshaft Test: 8 failures out of 10 samples One sample per engine revolution	
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor A	P0340	Determines if a fault exists with the cam position bank 1 sensor A signal	Engine Cranking Camshaft Test: Time since last camshaft position sensor pulse received OR Time that starter has been engaged without a camshaft sensor pulse Time-Based Camshaft Test:	 ≥ 5.5 seconds ≥ 4.0 seconds	Engine Cranking Camshaft Test: Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow Time-Based Camshaft Test:	 = FALSE = FALSE = FALSE > 3.0 grams/second	Engine Cranking Camshaft Test: Continuous every 100 msec Time-Based Camshaft Test:	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Fewer than 4 camshaft pulses received in a time <u>Fast Event-Based Camshaft Test:</u> No camshaft pulses received during first 12 MEDRES events (There are 12 MEDRES events per engine cycle) <u>Slow Event-Based Camshaft Test:</u> The number of camshaft pulses received during 100 engine cycles	> 3.0 seconds = 0	Engine is Running Starter is not engaged No DTC Active: <u>Fast Event-Based Camshaft Test:</u> 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: <u>Slow Event-Based Camshaft Test:</u> Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA 5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Continuous every 100 msec <u>Fast Event-Based Camshaft Test:</u> Continuous every MEDRES event <u>Slow Event-Based Camshaft Test:</u> 8 failures out of 10 samples Continuous every engine cycle	
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	<u>Fast Event-Based Camshaft Test:</u> The number of camshaft pulses received during first 12 MEDRES events is less than 4 or greater than 10		<u>Fast Event-Based Camshaft Test:</u> Crankshaft is synchronized Starter must be engaged to		<u>Fast Event-Based Camshaft Test:</u> Continuous every MEDRES event	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					enable the diagnostic, but the diagnostic will not disable when the starter is disengaged			
			(There are 12 MEDRES events per engine cycle)		No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA		
			<u>Slow Event-Based Camshaft Test:</u>		<u>Slow Event-Based Camshaft Test:</u>		<u>Slow Event-Based Camshaft Test:</u>	
			The number of camshaft pulses received during 100 engine cycles		Crankshaft is synchronized		8 failures out of 10 samples	
			OR	< 398 > 402	No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Continuous every engine cycle	
IGNITION CONTROL #1 CIRCUIT	P0351	This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 1 (Cylinders 1 and 4 for V6 with waste spark)	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine running Run/Crank Voltage	**> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2
IGNITION CONTROL #2 CIRCUIT	P0352	This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 2 (Cylinders 2 and 5 for V6 with waste spark)	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine running Run/Crank Voltage	**> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
IGNITION CONTROL #3 CIRCUIT	P0353	This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 3 (Cylinders 3 and 6 for V6 with waste spark)	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine running Run/Crank Voltage	 **> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2
IGNITION CONTROL #4 CIRCUIT	P0354	This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 4 (if applicable)	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine running Run/Crank Voltage	 **> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor B	P0365	Determines if a fault exists with the cam position bank 1 sensor B signal	<u>Engine Cranking Camshaft Test:</u> Time since last camshaft position sensor pulse received OR Time that starter has been engaged without a camshaft sensor pulse <u>Time-Based Camshaft Test:</u> Fewer than 4 camshaft pulses received in a time	 ≥ 5.5 seconds ≥ 4.0 seconds	<u>Engine Cranking Camshaft Test:</u> Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow <u>Time-Based Camshaft Test:</u> Engine is Running Starter is not engaged	 = FALSE = FALSE = FALSE > 3.0 grams/second	<u>Engine Cranking Camshaft Test:</u> Continuous every 100 msec <u>Time-Based Camshaft Test:</u> Continuous every 100 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
				> 3.0 seconds	No DTC Active:	5VoltReferenceA_FA		
			Fast Event-Based Camshaft Test:		Fast Event-Based Camshaft Test:		Fast Event-Based Camshaft Test:	
			No camshaft pulses received during first 12 MEDRES events		Crankshaft is synchronized		Continuous every MEDRES event	
			(There are 12 MEDRES events per engine cycle)		Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged			
					No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA		
			Slow Event-Based Camshaft Test:		Slow Event-Based Camshaft Test:		Slow Event-Based Camshaft Test:	
			The number of camshaft pulses received during 100 engine cycles		Crankshaft is synchronized		8 failures out of 10 samples	
					No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Continuous every engine cycle	
				= 0				
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	Fast Event-Based Camshaft Test:		Fast Event-Based Camshaft Test:		Fast Event-Based Camshaft Test:	Type B 2 trips
			The number of camshaft pulses received during first 12 MEDRES events is less than 4 or greater than 10		Crankshaft is synchronized		Continuous every MEDRES event	
					Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			(There are 12 MEDRES events per engine cycle) <u>Slow Event-Based Camshaft Test:</u> The number of camshaft pulses received during 100 engine cycles OR	 < 398 > 402	No DTC Active: <u>Slow Event-Based Camshaft Test:</u> Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA 5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	<u>Slow Event-Based Camshaft Test:</u> 8 failures out of 10 samples Continuous every engine cycle	
Catalyst System Low Efficiency Bank 1	P0420	Oxygen Storage	Normalized Ratio OSC Value (EWMA filtered)	< 0.350	***<u>Valid Idle Period Criteria</u>***		1 test attempted per valid idle period Minimum of 1 test per trip Maximum of 8 tests per trip Frequency: Fueling Related : 12.5 ms OSC Measurements: 100 ms Temp Prediction: 1000ms	Type A 1 Trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		The catalyst washcoat contains Cerium Oxide. Cerium Oxide reacts with NO and O2 during lean A/F excursions to store the excess oxygen (I.e. Cerium Oxidation). During rich A/F excursions, Cerium Oxide reacts with CO and H2 to release this stored oxygen (I.e. Cerium Reduction). This is referred to as the Oxygen Storage Capacity, or OSC. CatMon's strategy is to "measure" the OSC of the catalyst through forced Lean and Rich A/F excursions Normalized Ratio OSC Value Calculation Information and Definitions = 1. Raw OSC Calculation = (post cat O2 Resp time - pre cat O2 Resp time) 2. BestFailing OSC value from a calibration table (based on temp and exhaust gas flow) 3. WorstPassing OSC 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.			Driver must be off the accel pedal. This checks that the final accel pedal position (comprehending deadband and hysteresis) is essentially zero. Idle Speed Control System Is Active			
		The Catalyst Monitoring Test is done during idle. Several conditions must be meet in order to execute this test. These conditions and their related values are listed in the secondary parameters area of this document.			Vehicle Speed	< *1.24 MPH*		
					Engine speed	> 1200 RPM for a minimum of 25 seconds since end of last idle period.		
					Engine run time	≥ MinimumEngineRunTime**, This is a function of Coolant Temperature, please see Supporting Tables**		
					Tests attempted this trip	< 255		
					The catalyst diagnostic has not yet completed for the current trip.			
					Catalyst Idle Conditions Met Criteria			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					General Enable met and the Valid Idle Period Criteria met			
					Green Converter Delay	Not Active		
					Induction Air	-20 < ° C < 250		
					Intrusive test(s): Fueltrim Post O2 EVAP EGR	Not Active		
					Other vehicle functions: Power Take Off	Not Active		
					Run/Crank Voltage	> 10.90 Volts		
					Ethanol Estimation	NOT in Progress		
					ECT	50 < ° C < 130		
					Barometric Pressure	> 70 KPA		
					Idle Time before going intrusive is	< 50 Seconds		
					Idle time is incremented if Vehicle speed	< 1.24 MPH and the drivers foot is off accel pedal and the idle speed control system is active as identified in the Valid Idle Period Criteria section.		
					Short Term Fuel Trim	0.90 < ST FT < 1.25		
					Predicted catalyst temp > 600 degC AND Engine Airflow > MinAirflowToWarmCatalyst table (g/s) (refer to "Supporting Tables" tab) (Based on engine coolant at the time the WarmedUpEvents counter resets to 0.) for at least 28 seconds with a closed throttle time < 120 seconds consecutively (closed throttle consideration involves having the driver off the accel pedal as stated in the Valid Idle Period Criteria Section) . Also, in order to increment the WarmedUpEvents counter (counter must exceed 28 cal value), either the vehicle			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					speed must exceed the vehicle speed cal or the driver must NOT be off the accel pedal as stated in the Valid Idle Period Criteria section above.			
					Closed loop fueling Enabled A Function of Time also based on Start-up coolant temp. **Please see "Supporting Tables" Tab**			
					PRNDL is in Drive Range on an Auto Transmission vehicle.			
					Idle Stable Criteria :: Must hold true from after Catalyst Idle Conditions Met to the end of test			
					MAF	*1.75 < g/s < 9.00*		
					Predicted catalyst temperature	< 900 degC		
					Engine Fueling Criteria at Beginning of Idle Period			
					The following fueling related must also be met from between 4 and 7 seconds after the Catalyst Idle Conditions Met Criteria has been met for at least 4 seconds prior to allowing intrusive control			
					Number of pre-O2 switches	≥ 2		
					Short Term Fuel Trim Avg	0.960 < ST FT Avg < 1.040		
					Rapid Step Response (RSR) feature will initiate multiple tests:			
					If the difference between current EWMA value and the current OSC Normalized Ratio value is > 0.980 and the current OSC Normalized Ratio value is < 0.100			
					Maximum of 24 RSR tests to detect failure when RSR is enabled.			
					Green Converter Delay Criteria			
					This is part of the check for the Catalyst Idle Conditions Met Criteria section			
					The diagnostic will not be enabled until the following has been met:			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Predicted catalyst temperature > 550 ° C for 3600 seconds non-continuously. Note: this feature is only enabled when the vehicle is new and cannot be enabled in service			
					General Enable			
					DTC's Not Set			
					MAF_SensorFA			
					MAF_SensorTFTKO			
					AmbientAirDefault_NA			
					IAT_SensorCircuitFA			
					IAT_SensorCircuitTFTKO			
					ECT_Sensor_FA			
					O2S_Bank_1_Sensor_1_FA			
					O2S_Bank_1_Sensor_2_FA			
					O2S_Bank_2_Sensor_1_FA			
					O2S_Bank_2_Sensor_2_FA			
					FuelTrimSystemB1_FA			
					FuelTrimSystemB1_TFTKO			
					FuelTrimSystemB2_FA			
					FuelTrimSystemB2_TFTKO			
					EngineMisfireDetected_FA			
					EvapPurgeSolenoidCircuit_FA			
					IAC_SystemRPM_FA			
					EGRValvePerformance_FA			
					EGRValveCircuit_FA			
					CamSensorAnyLocationFA			
					CrankSensor_FA			
					TPS_Performance_FA			
					EnginePowerLimited			
					VehicleSpeedSensor_FA			
					AmbientAirDefault_NoSnsr			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Evaporative Emission (EVAP) System Small Leak Detected	P0442	This DTC will detect a small leak (≥ 0.020") in the EVAP system between the fuel fill cap and the purge solenoid. 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.	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. (See P0442: EONV Pressure Threshold Table on Supporting Tables Tab). 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).		Fuel Level Drive Time Drive length ECT Baro Odometer 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	10 % ≤ Percent ≤ 90 % ≥ 600 seconds ≥ 3.1 miles ≥ 70 °C ≥ 70 kPa ≥ 10.0 miles ≤ refer to "P0442: Engine Off Time Before Vehicle Off Maximum as a Function of Estimated Ambient Temperature table" in Supporting Tables. ≥ 17 hours ≥ 10 hours 0 °C ≤ Temperature ≤ 34 °C	Once per trip, during hot soak (up to 2400 sec.). No more than 2 unsuccessful attempts between completed tests.	1 trip Type A EWMA Average run length is 9 under normal conditions Run length is 6 trips after code clear or non-volatile reset
		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	When EWMA is , the DTC light is illuminated. The DTC light can be turned off if the EWMA is	> 0.52 (EWMA Fail Threshold)				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		(phase-1). The pressure typically will peak and then begin to decrease as the fuel cools. When the pressure drops (-62.27) Pa from peak pressure, the vent is then opened for 60 seconds to normalize the system pressure. The vent is again closed to begin the vacuum portion of the test (phase-2). As the fuel temperature continues to fall, a vacuum will begin forming. The vacuum will continue until it reaches a vacuum peak. When the pressure rises 62.27 Pa from vacuum peak, the test then completes. If the key is turned on while the diagnostic test is in progress, the test will abort.	and stays below the EWMA fail threshold for 2 additional consecutive trips.	≤ 0.35 (EWMA Re-Pass Threshold)	**Conditions for Estimate of 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 Must expire Estimate of Ambient Temperature Valid Conditioning Time. **"P0442: Estimate of Ambient Temperature Valid Conditioning Time" in Supporting Tables Tab.** OR **4. Not a Cold Start and greater than a Short Soak** Previous time since engine off AND Must expire maximum value in Estimate of Ambient Temperature Valid Conditioning Time. **Please see "P0442: Estimate of Ambient Temperature Valid Conditioning Time" in Supporting Tables Tab.**	 ≤ 8 °C ≤ 7200 seconds ≤ 7200 seconds Vehicle Speed ≥ 19.9 mph AND Mass Air Flow ≥ 6 g/sec > 7200 seconds Vehicle Speed ≥ 19.9 mph AND Mass Air Flow ≥ 6 g/sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Conditions for Estimate of Ambient Air Temperature to be valid:			
					1. Cold Start			
					Startup delta deg C (ECT-IAT)	≤ 8 °C		
					OR			
					2. Short Soak and Previous EAT Valid			
					Previous time since engine off	≤ 7200 seconds		
					OR			
					3. Time since EAT Valid			
					Time since EAT valid	≤ 7200 seconds		
					OR			
					4. Not a Cold Start and greater than a Short Soak			
					Previous time since engine off	> 7200 seconds		
					AND			
					Must expire maximum value in Estimate of Ambient Temperature Valid Conditioning Time. **Please see "P0442: Estimate of Ambient Temperature Valid Conditioning Time" in Supporting Tables Tab.**	Vehicle Speed ≥ 19.9 mph AND Mass Air Flow ≥ 6 g/sec		
				Abort Conditions:	**1. High Fuel Volatility**			
					During the volatility phase, pressure in the fuel tank is integrated vs. time. If the integrated pressure is	> -5		
					then test aborts and unsuccessful attempts is incremented.			
					OR			
					2. Vacuum Refueling Detected			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 during the EONV test OR **7. Key up during EONV test** No active DTCs:	0.50 seconds FuelLevelDataFault MAF_SensorFA ECT_Sensor_FA IAT_SensorFA VehicleSpeedSensor_FA IgnitionOffTimeValid AmbientAirDefault P0443		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0446 P0449 P0452 P0453 P0455 P0496		
Evaporative Emission (EVAP) Canister Purge Solenoid Valve Circuit (ODM)	P0443	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples 250 ms /sample Continuous with solenoid operation	2 trips Type B
Evaporative Emission (EVAP) Vent System Performance	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 or Vented Vacuum for 60 seconds Vent Restriction Test: Tank Vacuum for 5 seconds BEFORE Purge Volume 2 liters of fuel must be consumed after setting the DTC active the first time to set the DTC active the second time.	< -623 Pa > 1245 Pa > 2989 Pa ≥ 10 liters	Fuel Level Run/Crank Voltage Startup IAT Startup ECT BARO No active DTCs:	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C ≥ 70 kPa MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorCircuitFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453	Once per Cold Start Time is dependent on driving conditions Maximum time before test abort is 1000 seconds	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Evaporative Emission (EVAP) Vent Solenoid Control Circuit (ODM)	P0449	This DTC checks the circuit for electrical integrity during operation. If the P0449 is active, an intrusive test is performed with the vent solenoid commanded closed for 15 seconds.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples 250 ms / sample Continuous with solenoid operation	2 trips Type B
Fuel Tank Pressure (FTP) Sensor Circuit Performance	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	0.2 volts 0.2 volts > 0.73 (EWMA Fail 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.	1 trip Type A EWMA Average run length: 6 Run length is 2 trips after code clear or non-volatile reset

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			and stays below the EWMA fail threshold for 2 additional consecutive trips.	≤ 0.40 (EWMA Re-Pass Threshold)				
Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage	P0452	This DTC will detect a fuel tank pressure sensor signal that is too low out of range.	Fuel tank pressure sensor signal The normal operating range of the fuel tank pressure sensor is 0.5 volts (~1245 Pa) to 4.5 volts (~ -3736 Pa).	< 0.15 volts (3 % of Vref or ~ 1681 Pa)	Time delay after sensor power up for sensor warm-up ECM State ≠ crank	is 0.10 seconds	80 failures out of 100 samples 100 ms / sample Continuous	2 trips Type B
Fuel Tank Pressure (FTP) Sensor Circuit High Voltage	P0453	This DTC will detect a fuel tank pressure sensor signal that is too high out of range.	Fuel tank pressure sensor signal The normal operating range of the fuel tank pressure sensor is 0.5 volts (~1245 Pa) to 4.5 volts (~ -3736 Pa).	> 4.85 volts (97% of Vref or ~ -4172 Pa)	Time delay after sensor power up for sensor warm-up ECM State ≠ crank		80 failures out of 100 samples 100 ms / sample Continuous	2 trips Type B
Fuel Tank Pressure (FTP) Sensor Circuit Intermittent	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.		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.	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			The abrupt change is defined as a change in vacuum: in the span of 1.0 seconds. A refueling event is confirmed if the fuel level has a persistent change for 30 seconds.	112 Pa < Vacuum < 249 Pa of 10 %			The test will report a failure if 2 out of 3 samples are failures.	
Evaporative Emission (EVAP) System Large Leak Detected	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 BEFORE Tank vacuum 2 liters of fuel must be consumed after setting the DTC active the first time to set the DTC active the second time. <u>Weak Vacuum Follow-up Test</u> (fuel cap replacement test) Weak Vacuum Test failed. Passes if tank vacuum Note: Weak Vacuum Follow-up Test can only report a pass.	> 16 liters ≤ 2740 Pa ≥ 2740 Pa	Fuel Level Run/Crank Voltage BARO Purge Flow No active DTCs: <u>Cold Start Test</u> If ECT > IAT, Startup temperature delta (ECT-IAT) Cold Test Timer Startup IAT Temperature Startup ECT	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts ≥ 70 kPa ≥ 3.00 % MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorCircuitFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454 ≤ 8 °C ≤ 1000 seconds 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C	Once per cold start Time is dependent on driving conditions Maximum time before test abort is 1000 seconds <u>Weak Vacuum Follow-up Test</u> With large leak detected, the follow-up test is limited to 1300 seconds. Once the MIL is on, the follow-up test runs indefinitely.	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Weak Vacuum Follow-up Test This test can run following a weak vacuum failure or on a hot restart.			
Fuel Level Sensor 1 Performance	P0461	This DTC will detect a fuel sender stuck in range in the primary fuel tank.	Delta Fuel Volume change over an accumulated 224 miles.	< 3 liters	Engine Running No active DTCs:	VehicleSpeedSensor_FA	250 ms / sample Continuous	2 trips Type B
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 %	Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	180 failures out of 225 samples 100 ms / sample Continuous	2 trips Type B
Fuel Level Sensor 1 Circuit High Voltage	P0463	This DTC will detect a fuel sender stuck out ofrange high in the primary fuel tank.	Fuel level Sender % of 5V range	> 60 %	Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	180 failures out of 225 samples 100 ms / sample Continuous	2 trips Type B
Fuel Level Sensor 1 Circuit Intermittent	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, the sample is considered failing indicating an intermittent signal problem. An intermittent change in fuel level is defined as: The fuel level changes and does not remain	 by 10 % > 10 %	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete. The test will report a failure if 1 out of 3 samples are failures.	1 trip Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			for 30 seconds during a 600 second refueling rationality test.					
Cooling Fan 1 Relay Control Circuit (ODM)	P0480	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous with fan operation	2 trips Type B Not used on systems with Mechanical Fan)
Cooling Fan 2 Relay Control Circuit (ODM)	P0481	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous with fan operation	2 trips Type B Not used on systems with Mechanical Fan)
Evaporative Emission (EVAP) System Flow During Non-Purge	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 5 seconds BEFORE Test time	> 2491 Pa ≥ refer to "P0496: Purge Valve Leak Test Engine Vacuum Test Time (Cold Start) as a Function of Fuel Level table" in Supporting Tables Tab.	Fuel Level Run/Crank Voltage BARO Startup IAT Temperature Startup ECT Engine Off Time No active DTCs:	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts ≥ 70 kPa 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C ≥ 28800.0 seconds MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorCircuitFA	Once per cold start Cold start: max time is 1000 seconds	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454		
Low Engine Speed Idle system	P0506	This DTC will determine if a low idle exists	Filtered Engine Speed Error filter coefficient	> 91.00 rpm 0.003	Baro Coolant Temp Engine run time Ignition voltage Time since gear change Time since a TCC mode change IAT Vehicle speed Commanded RPM delta Idle time	> 70 kPa > 60 °C ≥ 60 sec 32 ≥ volts ≥ 11 ≥ 3 sec > 3 sec > -20 °C ≤ 2 mph ≤ 25 rpm > 10 sec PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active.	Diagnostic runs in every 12.5 ms loop Diagnostic reports pass or fail in 10 sec once all enable conds are met	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimit AND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion)		
					No active DTCs	AmbientAirDefault ECT_Sensor_FA EngCoolHot EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA EnginePowerLimited TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFault LowFuelConditionDiagnostic ClchPstnEmisFA ClchToT_TypedABC		
High Engine Speed Idle system	P0507	This DTC will determine if a high idle exists	Filtered Engine Speed Error filter coefficient	< -182.00 rpm 0.003	Baro Coolant Temp Engine run time	> 70 kPa > 60 °C ≥ 60 sec	Diagnostic runs in every 12.5 ms loop Diagnostic reports pass or fail in	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Ignition voltage	32 ≥ volts ≥ 11	10 sec once all enable conds are met	
					Time since gear change	≥ 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -20 °C		
					Vehicle speed	≤ 2 mph		
					Commanded RPM delta	≤ 25 rpm		
					Idle time	> 10 sec		
						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)		
					No active DTCs	AmbientAirDefault		
						ECT_Sensor_FA		
						EngCoolHot		
						EGRValveCircuit_FA		
						EGRValvePerformance_FA		
						IAT_SensorCircuitFA		
						EvapFlowDuringNonPurge_FA		
						FuelTrimSystemB1_FA		
						FuelTrimSystemB2_FA		
						FuelInjectorCircuit_FA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA EnginePowerLimited TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFault LowFuelConditionDiagnostic ClchPstnEmisFA ClchToT_TypedABC		
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 veh. 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)**		Runs once per trip when the cold start emission reduction strategy is active and Dual Pulse is enabled and active. Frequency: Engine Cycle Test completes after Dual Pulse is no longer active OR The first 500 engine cycles have been reached	Type B 2 Trip(s)
					To enable the diagnostic, the Cold Start Emission Reduction Strategy Must Be Active per the following:			
					Catalyst Temperature	< 500.00 degC		
					AND			
					Engine Coolant	> -10.00 degC		
					In addition, Dual Pulse Strategy Is Enabled and Active Per the following:			
					Engine Speed	> 250.00 RPM		
					Engine Speed	≤ 1900.00 RPM		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Barometric Pressure	≥ 60.00 KPa		
					For the engine speeds and loads in which Dual Pulse is active:			
					Dual Pulse Error induced misfires percentage	≥ catalyst damaging misfire		
					Dual Pulse Error induced misfires percentage	< 90% of the maximum achievable catalyst damaging misfire.		
					Engine Cycles	≥ 50		
					Engine Cycles	< 501		
					The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:			
					Catalyst Temperature	≥ 1000.00 degC		
					AND			
					Engine Run Time	≥ 17.50 seconds		
					OR			
					Engine Run Time	> 17.50 seconds		
					OR			
					Engine Coolant	≥ 56.00 degC		
					Dual Pulse Strategy will exit per the following:			
					Engine Speed	> 2000.00 RPM		
					OR			
					Barometric Pressure < 60.00 Kpa			
					Dual Pulse Strategy will also exit if the any of the "Additional Dual Pulse Enabling Criteria" from below are 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Output State Control	Not being requested for fuel		
					DOD Or DFCO	Not Active		
					Power Enrichment	Not Active		
					Piston Protection	Not Active		
					Hot Coolant Enrichment	Not Active		
					Injector Flow Test	Not Active		
					General Enable			
					DTC's Not Set			
					GetAPSR_b_PedalFailure			
					ECT_Sensor_FA			
					IAT_SensorCircuitFA			
					IAT2_SensorCircuitFA			
					CrankSensorFaultActive			
					FuelInjectorCircuit_FA			
					MAF_SensorFA			
					MAP_SensorFA			
					AnyCamPhaser_TFTKO			
					Clutch Sensor FA			
					IAC_SystemRPM_FA			
					IgnitionOutputDriver_FA			
					TPS_FA			
					VehicleSpeedSensor_FA			
					TransmissionEngagedState_FA			
					EngineTorqueInaccurate			
					GetFULD_b_InjCktTFTKO			
					GetFPMR_b_FuelPumpRlyCktFA			
					GetFDLV_b_FuelInjCkt_FA			
					GetFHPR_b_FRP_SnsrCkt_FA			
					GetFHPR_b_FRP_SnsrCkt_TFTKO			
					GetFHPR_b_PumpCkt_TFTKO			
					GetFHPR_b_PumpCkt_FA			
System Voltage Low	P0562	This DTC determines if the current Run/Crank Voltage is below the minimum required voltage for proper ECM operation.	Run/Crank Voltage	≤ 9 volts	Ignition is “ON”		5 failures out of 6 samples	1 trip Type C

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Speed	≥ 400 RPM	1 second / sample Continuous	
System Voltage High	P0563	This DTC determines if the current Run/Crank Voltage is above the maximum allowed voltage for proper ECM operation.	Run/Crank Voltage	≥ 18 volts	Ignition is “ON”		5 failures out of 6 samples 1 second / sample Continuous	1 trip Type C
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" for greater than a calibratable period of time for cruise switch states that are received over serial data				fail continuously for greater than 0.500 seconds	Type: C MIL: NO Trips: 1
Cruise Control Resume Circuit	P0567	Detects a failure of the cruise resume switch in a continuously applied state	Cruise Control Resume switch remains applied for greater than a calibratable period of time for architecture where cruise switch states are received over serial data				fail continuously for greater than 90.000 seconds	Type: C MIL: NO Trips: 1
Cruise Control Set Circuit	P0568	Detects a failure of the cruise set switch in a continuously applied state	Cruise Control Set switch remains applied for greater than a calibratable period of time for architecture where cruise switch states are received over serial data				fail continuously for greater than 90.000 seconds fail continuously for greater than 90.000 seconds	Type: C MIL: NO Trips: 1

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Cruise Control Input Circuit	P0575	Detects rolling count or protection value errors in Cruise Control Switch Status serial data signal	If x of y rolling count / protection value faults occur, disable cruise for duration of fault				10/16 counts	Type: C MIL: NO Trips: 1
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.	1) The Primary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1) 1 failure if the fault is detected during the first pass. 5 failures if the fault occurs after the first pass is complete.			1) Diagnostic runs continuously in the background	Type: A MIL: YES Trips: 1
			2) The Primary Processor's Error Correcting Code hardware in the flash memory detects an error. Covers all software and calibrations.	2) 5 failures detected via Error Correcting Code			2) Diagnostic runs continuously via the flash hardware	
			3) The Primary Processor's calculated checksum does not match the stored checksum value for a selected subset of the calibrations	3) 2 consecutive failures detected or 5 total failures detected.			3) Diagnostic runs continuously. Will report a detected fault within 200 ms.	
			4) The Secondary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	4) 1 failure if the fault is detected during the first pass. 5 failures if the fault occurs after the first pass is complete.			4) Diagnostic runs continuously in the background	
				In all cases, the failure count is cleared when controller shuts down				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Control Module Not Programmed	P0602	This DTC will be stored if the PCM is a service PCM that has not been programmed.	Output state invalid		ECM State	= crank or run ECM is identified through calibration as a Service ECM	Diagnostic runs at powerup	Type A 1 trips
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up does not match checksum at power-down				Diagnostic runs at powerup Diagnostic reports a fault if 1 failure occurs	Type A 1 trips
ECM RAM Failure	P0604	Indicates that the ECM has detected a RAM fault						Type: A MIL: YES Trips: 1
Primary Processor System 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 ≥	5 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
Primary Processor Cache RAM Fault			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 ≥	5 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
Primary Processor TPU RAM Fault			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)	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Primary Processor Update Dual Store RAM Fault			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 >	0.14781 seconds			When dual store updates occur.	
Primary Processor Write Protected RAM Fault			Indicates that the primary processor detects an illegal write attempt to protected RAM. Number of illegal writes are >	65534 counts			Diagnostic runs continuously (background loop)	
Secondary Processor RAM Fault			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)	
ECM Processor	P0606	Indicates that the ECM has detected an internal processor integrity fault						Type: A MIL: YES Trips: 1
Primary Processor SPI Fault Detected		Loss or invalid message of SPI communication from the Secondary Processor at initialization detected by the Primary Processor or loss or invalid message of SPI communication from the Secondary Processor after a valid message was received by the Primary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was received			Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	In the primary processor, 159/399 counts intermittent or 15 counts continuous; 39 counts continuous @ initialization	
Secondary Processor SPI Fault Detected		Loss or invalid message of SPI communication from the Primary Processor at initialization detected by the Secondary Processor or loss or invalid message of SPI communication from the Primary Processor after a valid message was received by the Secondary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was received				In the secondary processor, 20/200 counts intermittent or 0 counts continuous; 0 counts continuous @ initialization	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Secondary Processor Stack Fault		Checks for stack over or underflow in secondary processorby looking for corruption of known pattern at stack boundaries	Checks number of stack over/under flow since last powerup reset ≥	5			variable, depends on length of time to corrupt stack	
Secondary processor received incorrect Keys		MAIN processor is verified by responding to a seed sent from the secondary with a key response to secondary	Checks number of incorrect keys received > or Secondary processor has not received a new within time limit	2 incorrect seeds within 8 messages, 0.200 seconds		ignition in Run or Crank	150 ms for one seed continually failing	
MAIN processor did not receive seed within time limit		MAIN processor did not receive seed within time limit	Time >	0.500 seconds		always running	0.500 seconds	
MAIN processor receives seed in wrong order		MAIN processor test for seeds to arrive in a known sequence	X out of Y	3 out of 17		always running	3* 50 ms	
Secondary processor ALU check		Verify secondary processor correctly performs know calculation. Verify the integrity of all general purpose registers	2 fails in a row				12.5 ms	
Secondary processor configuration register check		Verify secondary processor configuration register masks versus known good data	2 fails in a row				12.5 to 25 ms	
MAIN processor discrete fault		Secondary processor does not detect the toggling of a hardware discrete line controlled by the MAIN processor	number of discrete changes ≥ or ≤ over time window(50ms)	7 17		time from initialization ≥ 0.488 seconds	50 ms	
MAIN detected corruption in throttle or pedal critical RAM data		Test for critical values versus dual stores and for values in correct range	Continuous error for time >	0.19 seconds			0.19 seconds	
Processor Performance Check - ETC software is not executed in proper order			1. Software tasks loops > schedule tasks loop 2. 12.5ms task loop sequence does not complete ≥	See supporting tables 0.19 seconds			Error > 5 times of loop time; loop times are 6.25, 12.5, 25 ms in the main processor	
Processor Performance Check - ETC software is not completing background task			Software background task first pass time to complete >	60.000 seconds	Powertrain relay	> 6.00 V	30 s	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
MAIN processor ALU check		Verify MAIN processor correctly performs know calculation. Verify the integrity of all general purpose registers	2 fails in a row				12.5 ms	
MAIN processor configuration register check		Verify secondary processor configuration register masks versus known good data	2 fails in a row				12.5 to 25 ms	
MAIN Stack Fault		Checks for stack over or underflow in MAIN processor by looking for corruption of known pattern at stack boundaries	Checks number of stack over/under flow since last powerup reset ≥	5			variable, depends on length of time to corrupt stack	
MAIN processor ADC test		A test Voltage of known value is read by the MAIN processor via an ADC channel	Voltage deviation >	9			3 / 8 counts or 0.150 seconds continuous; 50 msec/count in main processor	
Flash ECC Fault		Checks for ECC (error correcting code) circuit test errors reported by the hardware for flash memory.	Increments counter during controller initialization if ECC error occurred since last controller initialization. Counter ≥	3 (results in MIL), 5(results in MIL and remedial action)			variable, depends on length of time to access flash with corrupted memory	
RAM ECC Fault		Checks for ECC (error correcting code) circuit test errors reported by the hardware for RAM memory circuit.	Increments counter during controller initialization if ECC error occurred since last controller initialization. Counter ≥	3 (results in MIL), 5 (results in MIL and remedial action)			variable, depends on length of time to access flash with corrupted memory	
Starter Relay Control Circuit	P0615	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms / sample Continuous	1 trip Type C
Fuel Pump Relay Control Circuit Open	P0627	This DTC checks for an open and shorted high circuit while the device is commanded off.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 0 RPM	20 failures out of 25 samples 250 ms /sample Continuous with device off	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel Pump Relay Control Circuit Low Voltage	P0628	This DTC checks for a shorted low circuit while the device is commanded on.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 0 RPM	20 failures out of 25 samples 250 ms /sample Continuous with device on	2 trips Type B
Fuel Pump Relay Control Circuit High Voltage	P0629	This DTC checks for an open and shorted high circuit while the device is commanded off.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 0 RPM	20 failures out of 25 samples 250 ms /sample Continuous with device off	2 trips Type B
Internal Control Module Fuel Injector Control Performance	P062B	This DTC checks the circuit for electrical integrity during operation.	Internal ECU Boost Voltage OR Internal ECU Boost Voltage OR Driver Status OR Driver Status	≥ 90 Volts ≤ 40 Volts = Not Ready = Uninitialized	Run/Crank Voltage	8.0 ≤ Volts ≤ 255.0 Enabled when a code clear is not active or not exiting device control Engine is not cranking	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	1 trips Type A
Control Module EEPROM Error	P062F	Indicates that the NVM Error flag has not been cleared	The next write to NVM will not succeed or the assembly calibration integrity check failed.		Ignition State	#NAME?	1 test failure Diagnostic runs once at powerup	Type A 1 trips
VIN Not Programmed or Mismatched - Engine Control Module (ECM)	P0630	This DTC checks VIN is correctly written	At least one of programmed VIN's digit	= 00 or FF	OBD Manufacturer Enable Counter	= 0	250 ms / test Continuous	Type A 1 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL 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 >	4.875 5.125		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
Air Conditioning Clutch Relay Control Circuit	P0645	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 400 RPM	20 failures out of 25 samples 250 ms / sample Continuous	1 trip Type C
Malfunction Indicator Lamp (MIL) Control Circuit (ODM)	P0650	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Remote Vehicle Start is not active	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples 250 ms / sample Continuous	2 trip Type B YES MIL
5 Volt Reference #2 Circuit	P0651	Detects a continuous or intermittent short on the 5 volt reference circuit #2	ECM Vref2 < or ECM Vref2 >	4.875 5.125		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
Powertrain Relay Control (ODM)	P0685	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	8 failures out of 10 samples 250 ms / sample Continuous	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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.	PT Relay feedback voltage is Stuck Test: PT Relay feedback voltage is when commanded 'OFF'	≥ 18 volts > 2 volts	Powertrain relay commanded "ON" No active DTCs:	PowertrainRelayStateOn_FA	5 failures out of 6 samples 1second / sample Stuck Test: 100 ms/ sample Continuous failures ≥ 2 seconds	2 trips Type B
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on the 5 volt reference circuit #1	ECM Vref3 < or ECM Vref3 >	4.875 Volts 5.125 Volts		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
5 Volt Reference #4 Circuit	P06A3	Detects a continuous or intermittent short on the 5 volt reference circuit #2	ECM Vref4 < or ECM Vref4 >	4.875 Volts 5.125 Volts		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
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	Gated FFT Diagnostic Output (VaKNKD_k_OpenTestCktIntFilter[0])	> OpenTestThreshLo **and** < OpenTestThreshHi See Supporting Tables	Diagnostic Enabled (1 = Enabled) Engine Speed Engine Air Flow	= 1 > 400 RPM and < 3500 RPM ≥ 40 mg/cylinder and ≤ 2000 mg/cylinder	First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0100	Type: B MIL: YES Trips: 2

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							Updated each engine event Max time to set = 10 seconds	
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 1 trips MIL: NO
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 1 trips MIL: NO
Traction Control Torque Request Circuit	P0856	Determines if torque request from the EBTCM is valid	Serial Communication 2's complement message - ($140 for PPEI2 or $1C9 for PPEI3, $1CA for Hybrid)) **OR** Serial Communication message ($140 for PPEI2 or $1C9 for PPEI3, $1CA for Hybrid)) rolling count value **OR**	Message <> 2's complement of message Message rolling count value <> previous message rolling count value plus one	Serial communication to EBTCM (U0108) Power Mode Engine Running Status of traction in GMLAN message ($4E9)	No loss of communication = Run = True = Traction Present	**All except Class2 PWM:** Count of 2's complement values not equal ≥ 20 10 rolling count failures out of 10 samples	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Too many minimum limit torque request transitions occur from TRUE to FALSE to TRUE within a time period Torque request greater than allowed	Requested torque intervention type toggles from not increasing request to increasing request			≥ 5 multi-transitions out of 5 samples ≥ 4 out of 10 samples above 250 Nm for engine based traction torque system, 4000 Nm for axle based traction torque system Performed every 25 msec	1 trip(s) Type C
Inlet Airflow System Performance	P1101	Determines if there are multiple air induction problems affecting airflow and/or manifold pressure.	Filtered Throttle Model Error AND (ABS(Measured Flow – Modeled Air Flow) Filtered OR ABS(Measured MAP – MAP Model 1) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	≤ 300 kPa*(g/s) > 17 grams/sec > 25.0 kPa) > 25.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together)	≥ 400 RPM ≤ 6600 RPM > 70 Deg C < 125 Deg C > -20 Deg C < 125 Deg C ≥ 0.19 Filtered Throttle Model Error multiplied by TPS Residual Weight Factor based on RPM Modeled Air Flow multiplied by MAF Residual Weight Factor	Continuous Calculation are performed every 12.5 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						based on RPM and MAF Residual Weight Factor Based on MAF Estimate MAP Model 1 multiplied by MAP1 Residual Weight Factor based on RPM MAP Model 2 multiplied by MAP2 Residual Weight Factor based on RPM See table "IFRD Residual Weighting Factors". MAP_SensorCircuitFA EGRValve_FP EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA ECT_Sensor_Ckt_FP IAT_SensorFA IAT_SensorCircuitFP		
					No Active DTCs:			
O2S Insufficient Switching Bank 1 Sensor 1	P1133	This DTC determines if the O2 sensor is no longer sufficiently switching.	Fault condition present if Half Cycle L/R or R/L Switches are below the threshold. OR	H/C L/R switches < Threshold, or H/C R/L switches < Threshold, (refer to table named "P1133 - O2S HC L to R Switches Limit Bank 1 Sensor 1" Pass/Fail	No Active DTC's	TPS_ThrottleAuthority Defaulted MAP_SensorFA IAT_SensorFA	Sample time is 60 seconds	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			If Slope Time L/R or R/L Switches are below the threshold.	Threshold table & "P1133 - O2S HC R to L Switches Limit Bank 1 Sensor 1" Pass/Fail Threshold table in Supporting tables tab) OR S/T L/R switches < 5, or S/T R/L switches < 5		ECT_Sensor_FA AmbientAirDefault_No Snsr MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsr Ckt_FA FuelInjectorCircuit_FA AIR System FA EthanolCompositionSensor_FA EngineMisfireDetected_FA	Frequency: Once per trip Green Sensor Delay Criteria The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					Bank 1 Sensor 1 DTC's not active	= P0131, P0132 or P0134		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 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		
					Green O2S Condition	= Not Valid		
					O2 Heater on for	≥ 40 seconds		
					Learned Htr resistance	= Valid		
					Engine Coolant	> 70 ºC		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					IAT	> -40 ºC		
					Engine run Accum	> 120 seconds		
					Time since any AFM status change	> 2.0 seconds		
					Time since Purge On to Off change	> 0.0 seconds		
					Time since Purge Off to On change	> 1.5 seconds		
					Purge duty cycle	≥ 0 % duty cycle		
					Engine airflow	14 gps ≤ engine airflow ≤ 40 gps		
					Engine speed	1000 ≤ RPM ≤ 3500		
					Fuel	< 87 % Ethanol		
					Baro	> 70 kpa		
					Air Per Cylinder	≥ 215 mGrams		
					Low Fuel Condition Diag	= False		
					Fuel Control State	= Closed Loop		
					Closed Loop Active	= TRUE		
					LTM fuel cell	= Enabled		
					Transient Fuel Mass	≤ 100.0 mgrams		
					Baro	= Not Defaulted		
					Fuel Control State	not = Power Enrichment		
					Fuel State	DFCO not active		
					Commanded Proportional Gain	≥ 0.0 %		
					All of the above met for Time	> 3.0 seconds		
Injector 1 low side circuit shorted to high side circuit	P1248	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to low side		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to low side		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 3 low side circuit shorted to high side circuit	P124A	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to low side		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 4 low side circuit shorted to high side circuit	P124B	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to low side		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Ignition Coil Positive Voltage Circuit Group 1	P135A	This diagnostic checks for voltage supply to the Ignition Coils (applicable only for SIDI applications)	Ignition Module Supply Voltage.	< 2.5 Volts	Diagnostic Enabled/Disabled	Enabled	50 Failures out of 63 Samples 6.25 msec rate	Type: A MIL: YES Trips: 1
					Delay Enabled/Disabled	Disabled		
					Delay time starting at Ignition-On	31 (msec)		
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 estimated accumulated exhaust power OR Average desired accumulated exhaust power - Average estimated accumulated exhaust power (EWMA filtered)	< -32.00 KJ/s (high RPM failure mode) > 3.48 KJ/s (low RPM failure mode)	**To enable the diagnostic, the Cold Start Emission Reduction Strategy must be Active per the following:** Catalyst Temperature: < 500.00 degC **AND** Engine Coolant: > -10.00 degC **The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:** Catalyst Temperature: ≥ 1000.00 degC **AND** Engine Run Time: ≥ 17.50 seconds **OR**		Runs once per trip when the cold start emission reduction strategy is active Frequency: 100ms Loop Test completes after 8 seconds of accumulated qualified data.	Type A 1 Trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Run Time	> 17.50 seconds		
					OR			
					Engine Coolant	≥ 56.00 degC		
					Other Enable Criteria			
					Vehicle Speed	< 1.24 MPH		
					Driver must be off the accel pedal. This checks that the final accel pedal position (comprehending deadband and hysteresis) is essentially zero.			
					A change in throttle position (tip-in/tip-out) will initiate a delay in the calculation of the average qualified residual value. When the			
					Pedal Close Delay Timer	> 5.00 seconds		
					the diagnostic will continue the calculation.			
					Clutch Pedal Position	< 5.00 pct		
					Clutch Pedal Position	> 5.00 pct		
					Idle Speed Control System	Active		
					General Enable			
					DTC's Not Set			
					GetAPSR_b_PedalFailure			
					ECT_Sensor_FA			
					IAT_SensorCircuitFA			
					IAT2_SensorCircuitFA			
					CrankSensorFaultActive			
					FuelInjectorCircuit_FA			
					MAF_SensorFA			
					MAP_SensorFA			
					EngineMisfireDetected_FA			
					Clutch Sensor FA			
					IAC_SystemRPM_FA			
					IgnitionOutputDriver_FA			
					P050A (ColdStrt_IAC_SysPerf)			
					P050B (ColdStrtIgnTmngPerf)			
					TPS_FA			
					VehicleSpeedSensor_FA			
					GetVLTR_b_MAP_OOR_Flt			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					TransmissionEngagedState_FA EngineTorqueInaccurate			
Transmission Engine Speed Request Circuit	P150C	Determines if engine speed request from the TCM is valid	Serial Communication rolling count value Transmission engine speed protection	+ 1 from previous $19D message (PTEI3) not equal to 2's complement of transmission engine speed request + Transmission alive rolling count	Diagnostic enable bit Engine run time # of Protect Errors # of Alive Rolling Errors No idle diagnostic 506/507 code No Serial communication loss to TCM Engine Running Power mode	1 ≥ 0.5 10 6 IAC_SystemRPM_FA (U0101) = TRUE Run Crank Active	Diagnostic runs in 25 ms loop	2 trips Type B
Steady State Actuation Fault	P1516	Detect an inability to maintain a steady state throttle position	Throttle is considered to be steady state when: Change in throttle position over 12.5 msec has not exceeded for this amount of time	0.25 percent 4.00 seconds		Run/crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	0.49 ms	Type: A MIL: YES Trips: 1
Fuel Economy Mode Circuit Low	P159F	This DTC will detect a fuel saver switch input that is too low out of range.	Fuel Saver Switch % of 5V range The normal operating range of the fuel saver mode switch is: Switch depressed: % of 5V range	< 29.0 % < 66.8 % ≥ 29.0 %			200 failures out of 250 samples 25 ms / sample Continuous	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Switch released: % of 5V range	< 88.8 % ≥ 72.8 %				
Fuel Economy Mode Circuit High	P15A0	This DTC will detect a fuel saver switch input that is too high out of range.	Fuel Saver Switch % of 5V range The normal operating range of the fuel saver mode switch is: Switch depressed: % of 5V range Switch released: % of 5V range	≥ 88.8 % < 66.8 % ≥ 29.0 % < 88.8 % ≥ 72.8 %			200 failures out of 250 samples 25 ms / sample Continuous	2 trips Type B
Fuel Economy Mode Switch Performance	P15A1	This DTC will detect a fuel saver switch input that is in an indeterminate range.	Fuel Saver Switch % of 5V is in an indeterminate range: The normal operating range of the fuel saver mode switch is: Switch depressed: % of 5V range Switch released: % of 5V range	66.8 % ≤ % 5 volts < 72.8 % < 66.8 % ≥ 29.0 % < 88.8 % ≥ 72.8 %			200 failures out of 250 samples 25 ms / sample Continuous	2 trips Type B
Remote Vehicle Speed Limiting Signal Circuit	P162B	Determines if the speed request from OnStar is valid	**Password Protect error** - Serial Communication message - ($3ED)		Vehicle Requested Speed Limit	< 134.8 mph		1 trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
				Message <> two's complement of message **OR**			≥ 10 Password Protect errors out of 10 samples	Type C
			Rolling count error - Serial Communication message ($3ED) rolling count value	Message <> previous message rolling count value + one			≥ 10 Rolling count errors out of 10 samples	
							Performed every 25 msec	
Internal Control Module SIDI High Pressure Pump current monitor	P163A	This DTC checks 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	≥ 3.00 Amps	Run/Crank Voltage Low Side Fuel Pressure	11 ≤ Volts ≤ 32 > 0.275 MPa	Current High - 750 failures out of 938 samples	2 trips Type B
			SIDI fuel pump Low Current Test Current	≤ 0.10 Amps	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	≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Current Low - 750 failures out of 938 Samples	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active			
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 – ETC Run/Crank| >	3.00 Volts	Powertrain commanded on and Run/Crank Voltage > or ETC System Voltage > and Run/Crank Voltage >	 Table, f(IAT). See supporting tables 5.5 Volts 5.5 Volts	240/480 counts or 0.1750sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
Internal Control Module Redundant Memory Performance	P16F3	Detect Processor Calculation faults due to RAM corruptions, ALU failures and ROM failures						Type: A MIL: YES Trips: 1
			Desired engine torque request greater than redundant calculation plus threshold	79.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Engine min capacity above threshold	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 138 ms continuous, 0.5 down time multiplier	
			No fast unmanaged retarded spark above the applied spark plus the threshold	Table, f(Erpm). See supporting tables		Engine speed greater than 0rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			Absolute difference of adjustment factor based on temperature and its dual store above threshold	1.31 m/s		Ignition in unlock/accessory, run or crank	Up/down timer 92 ms continuous, 0.5 down time multiplier	
			1) Absolute difference of redundant calculated engine speed above threshold 2)Time between lores events and its dual store do not equal	KeEPSD_n_LoresSecurBndry 250 RPM		Engine speed greater than 0rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			After throttle blade pressure and its dual store do not match	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Speed Control's Predicted Torque Request and its dual store do not match	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Engine oil temperature and its dual store do not equal	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 438 ms continuous, 0.5 down time multiplier	
			Desired throttle position greater than redundant calculation plus threshold	9.09 percent		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of the rate limited pre-throttle pressure and its redundant calculation greater than threshold	2.02 kpa		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Throttle desired torque above desired torque plus threshold	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Desired filtered throttle torque exceeds the threshold plus the higher of desired throttle torque or modeled throttle torque	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Torque feedback proportional term is out of allowable range or its dual store copy does not match	High Threshold 40.15 Nm Low Threshold -40.15 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Torque feedback integral term magnitude or rate of change is out of allowable range or its dual store copy does not match	High Threshold 75.28 Nm Low Threshold -80.30 Nm Rate of change threshold 5.02 Nm/loop		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Difference of Final Torque feedback proportional plus integral term and its redundant calculation is out of bounds given by threshold range	High Threshold 80.30 Nm Low Threshold -80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Difference of torque desired throttle area and its redundant calculation is out of bounds given by threshold range	High Threshold 0.50% Low Threshold -0.50%		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Difference of torque model coefficients and its redundant calculation is out of bounds given by threshold range	High Threshold 0.0001588 Low Threshold -0.0001588		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Difference of base friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 80.30Nm Low Threshold -80.30Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 80.30 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			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 in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Difference of Oil temperature delta friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 80.30 Nm Low Threshold -80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Generator friction torque is out of bounds given by threshold range	High Threshold 80.30 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Supercharger friction torque is out of bounds given by threshold range	High Threshold 80.30 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Filtered Torque error magnitude or its increase rate of change is out of allowable range or its dual store copy does not match	High Threshold 80.30 Nm Low Threshold -80.30 Nm Rate of change threshold 5.02 Nm/loop		Engine speed >0rpm MAF, MAP and Baro DTCs are false	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Torque error compensation is out of bounds given by threshold range	High Threshold 80.30 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Delta Torque Baro compensation is out of bounds given by threshold range	High Threshold 3.84 Nm Low Threshold -2.11 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			1) Difference of reserve torque value and its redundant calculation exceed threshold 2) Reserve request does not agree with operating conditions 2) Difference of final predicted	1) 79.30 Nm 2) NA 3) 79.30 Nm 4) 79.30 Nm		1&2) Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 80.30	Up/down timer 475 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			torque and its redundant calculation exceed threshold 3) Rate of change of reserve torque exceeds threshold, increasing direction only 4) Reserve engine torque above allowable capacity by the threshold			Nm 3&4) Ignition in unlock/accessory, run or crank		
			Absolute difference of the calculated spark offset for equivalence ratio and its redundant calculation greater than threshold	10.28 degrees		Engine speed >0rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			Engine Vacuum and its dual store do not match	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of the calculated Intake Manifold Pressure during engine event versus during time event is greater than threshold	Table, f(Engine Torque). See supporting tables		Engine speed >0rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			Min. Axle Torque Capacity is greater than threshold	0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Predicted torque for zero pedal determination is greater than calc'ed limit.	Table, f(Engine, Oil Temp). See supporting tables + 80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Commanded Predicted Axle Torque and its dual store do not match	1 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Steady State Estimated Engine Torque and its dual store are not equal	N/A		DoD not changing from Active to Inactive and preload torque not changing and one loop after React command Engine speed >0rpm	Up/down timer 1988 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Difference of Weighting factor for number of cylinders fueled and its redundant calculation is above threshold	0.26		Engine run flag = TRUE > 1.00s	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Difference of minimum spark advance limit and its redundant calculation is out of bounds given by threshold range	10.28 degrees		Ignition in unlock/accessory, run or crank	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			Difference of commanded spark advance and adjusted delivered is out of bounds given by threshold range	10.28 degrees		Engine speed >0rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			Estimated Engine Torque and its dual store are not match	80.30 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Estimated Engine Torque without reductions due to torque control and its dual store are not match	80.30 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Difference of desired spark advance for managed torque and its redundant calculation is out of bounds given by threshold range	10.28 degrees		Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 80.30 Nm	Up/down timer 435 ms continuous, 0.5 down time multiplier	
			Absolute difference of Engine Capacity Minimum Running Immediate Brake Torque Excluding Cylinder Sensitivity and its redundant calculation is out of bounds given by threshold range	80.30 Nm		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			One step ahead calculation of air-per-cylinder and its dual store do not match	133.61 mg		Engine speed >0rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			One step ahead calculation of air-per-cylinder greater than two step ahead calculation by threshold for time	Threshold: Dynamically calculated based on current engine conditions Fault Pending Threshold: 100 ms		Engine speed > 575rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			Rate limited cruise axle torque request and its dual store do not match	157.67 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 163 ms continuous, 0.5 down time multiplier	
			1) Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range 2) Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its dual store do not equal 3) Absolute difference of Calculated accelerator pedal position and its dual store do not equal	1) 5.00 % 2) NA 3) NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Commanded axle torque is greater than its redundant calculation by threshold	1261.39 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Commanded axle torque is less than its redundant calculation by threshold	-946.04 Nm		Ignition in unlock/accessory, run or crank Redundant commanded axle torque < --946.04 Nm	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Commanded engine torque due to fast actuators and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Commanded engine torque due to slow actuators and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 0.200		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Launch spark is active but the launch spark redundant path indicates it should not be active	NA		Engine speed < 7000.00 or 7200.00 rpm (hysteresis pair)	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			Rate limited vehicle speed and its dual store do not equal	NA		Time since first CAN message with vehicle speed ≥ 0.500sec	10/20 counts; 25.0msec/count	
			transfer case neutral request from four wheel drive logic does not match with operating conditions	NA		Ignition in unlock/accessory, run or crank Transfer case range valid and not over-ridden	32/400 counts; 25.0msec/count FWD Apps only	
			transfer case neutral and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	8/16 counts; 25.0msec/count FWD Apps only	
			Throttle progression mode and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			TOS to wheel speed conversion factor is out of bounds given by threshold 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 in unlock/accessory, run or crank	255/6 counts; 25.0msec/count	
			TOS to wheel speed conversion factor and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	255/6 counts; 25.0msec/count	
			Cylinders active greater than commanded	2 cylinders		Engine run flag = TRUE > 2.00s Number of cylinder events since engine run > 24 No fuel injector faults active	Up/down timer 135 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Absolute difference of Friction torque and its redundant calculation is out of bounds given by threshold range	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of Accessory torque and its redundant calculation is out of bounds given by threshold range	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference of Filtered Air-per-cylinder and its redundant calculation is out of bounds given by threshold range	133.61 mg		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Absolute difference between the previous Final Advance and the current Final Advance not Adjusted for Equivalence Ratio is out of bounds given by threshold range	10.28 degrees		Engine speed >0rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	
			Desired Throttle Area calculated does not equal its redundant calculation	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Equivance Ratio torque compensation exceeds threshold	-80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Absolute difference between Equivance Ratio torque compensation and its dual store out of bounds given bt threshold	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Commanded Predicted Engine Torque and its dual store do not match	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 1261.39 Nm Low Threshold -1892.09 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Torque Learn offset is out of bounds given by threshold range	High Threshold 0.00 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			One step ahead calculation of air-per-cylinder and two step ahead is greater than threshold	80.00 mg		Engine speed >575rpm	Up/down timer 435 ms continuous, 0.5 down time multiplier	
			Difference between Unmanaged Spark and PACS Spark is greater than threshold	10.28 degrees		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multiplier	
			Predicted torque for uncorrected zero pedal determination is greater than calc'ed limit.	Table, f(Engine, Oil Temp). See supporting tables + 80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Idle speed control calculated predicted minimum torque request exceeds calculated torque limit	Table, f(Engine, Oil Temp). See supporting tables + 80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	Table, f(Engine, Oil Temp). See supporting tables + 80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Difference between Driver Requested Immediate Torque primary path and its secondary exceeds threshold	1261.39 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multiplier	
			Engine Speed Lores Intake Firing (event based) calculation does not equal its redundant calculation	N/A		Engine speed greater than 0rpm	Up/down timer 135 ms continuous, 0.5 down time multiplier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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 135 ms continuous, 0.5 down time multiplier	
			Engine Speed Lores Intake Firing (12.5ms based) calculation does not equal its redundant calculation	N/A		Engine speed greater than 0rpm	Up/down timer 175 ms continuous, 0.5 down time multiplier	
Fuel Level Sensor 2 Performance	P2066	This DTC will detect a fuel sender stuck in range in the secondary fuel tank.			Engine Running No active DTCs:	 VehicleSpeedSensor_FA	250 ms / sample Continuous	2 trips Type B
			Fuel Level in Secondary Tank Remains in an Unreadable Range too Long					
			If fuel volume in primary tank is AND Fuel volume in secondary tank and remains in this condition for OR	≥ 1024.0 liters < 2.0 liters 124 miles				
			Fuel Level is in a Readable Range for both Primary and Secondary Tanks too Long					
			Volume in Primary Tank AND Volume in Secondary Tank and remains in this condition for OR	< 1024 liters > 2 liters 36030 seconds				
			Distance Traveled without a Secondary Fuel Level Change					
			If the vehicle is driven a distance of 242 miles without the secondary fuel level changing by 3 liters, then the sender must be stuck.		Volume in Secondary Tank	≥ 2.0 liters		
Fuel Level Sensor 2 Circuit Low Voltage	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 %	Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	180 failures out of 225 samples 100 ms / sample	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							Continuous	
Fuel Level Sensor 2 Circuit High Voltage	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 %	Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	180 failures out of 225 samples 100 ms / sample Continuous	2 trips Type B
Control Module Throttle Actuator Position Performance	P2101	1) Detect a throttle positioning error	Difference between measured throttle position and modeled throttle position >	9.09 percent		Run/crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	15 counts; 12.5 msec/count in the primary processor	Type: A MIL: YES Trips: 1
					TPS minimum learn is not active and Throttle is being Controlled and			
			Difference between modeled throttle position and measured	9.09 percent	(Engine Running or Ignition Voltage > or Ignition Voltage >)	11 5.5		
					Ignition voltage failure is false (P1682)			
		2) Detect throttle control is driving the throttle in the incorrect direction or exceed the reduced power limit	Throttle Position >	41.94 percent	TPS minimum learn is active		2. 11counts; 12.5 msec/count in the primary processor	
			Throttle Position >	40.94 percent	Reduced Power is True			
					Powertrain relay voltage	> 6.00 Volts		
Throttle return to default	P2119	Throttle unable to return to default throttle position after de-energizing ETC motor.	TPS1 Voltage >	1.94	Throttle de-energized	Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	0.4969sec	Type: C
			AND		No TPs circuit faults			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			TPS2 Voltage >	1.94		No 5V reference error No 5 V reference DTCs		MIL: NO Trips:
					PT Relay Voltage >	5.5 Volts		1
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 <	0.463 Volts		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 (P06A3) 5V reference circuit	19/39counts or 14counts continuous; 12.5 msec/count in the main processor	Type: A MIL: YES Trips: 1
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 >	4.75 Volts	Run/crank voltage Powertrain relay voltage	Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 (P06A3) 5V reference circuit	1. 19/39counts or 14counts continuous; 12.5 msec/count in the main processor	Type: A MIL: YES Trips: 1
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 <	0.325 Volts		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	1. 19/39counts or 14counts continuous; 12.5 msec/count in the main processor	Type:

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
								A
						No 5V reference error for # 3 5V reference circuit No P0697		MIL: YES
								Trips: 1
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 >	2.6 Volts		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	1. 19/39counts or 14 counts continuous; 12.5 msec/count in the main processor	Type: A
						No 5V reference error for # 3 5V reference circuit No P0697		MIL: YES
								Trips: 1
Throttle Position (TP) Sensor 1-2 Correlation	P2135	1. Detects a continuous or intermittent correlation fault between TP sensors #1 and #2 on Main processor	1. Difference between TPS1 displaced and TPS2 displaced >	7.022% offset at min. throttle position with an increasing to 10% at max. throttle position		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	1. 79/159 counts or 58 counts continuous; 3.125 msec/count in the main processor	Type: A
						No 5V reference error for # 4 (P06A3) 5V reference circuit		MIL: YES
						No TPS sensor faults		Trips: 1
		2. Detects a continuous or intermittent correlation fault between TP sensors #1 and #2 on MHC processor	2. Difference between (raw min TPS1) and (raw_min TPS2) >	5.000 % of Vref				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY 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	1. the difference between APP 1 displaced and APP 2 displaced is >	10.001% offset at min. throttle position with an increasing to 10% (0.5v)at max. throttle position for Main processor.		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions No APP sensor faults P2122, P2123,P2127, P2128	1. 19/39 counts intermittent or 15 counts continuous, 12.5 msec/count in the main processor	Type: A MIL: YES Trips: 1
			2. Difference between the learned PPS1 min and PPS2 min >	5.000% Vref		No 5 V reference DTCs P06A3,P0697		
Injector 1 high side circuit shorted to ground	P2147	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to ground		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 1 high side circuit shorted to power	P2148	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to power		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 2 high side circuit shorted to ground	P2150	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to ground		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 2 high side circuit shorted to power	P2151	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to power		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 3 high side circuit shorted to ground	P2153	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to ground		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 3 high side circuit shorted to power	P2154	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to power		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Injector 4 high side circuit shorted to ground	P2156	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to ground		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 4 high side circuit shorted to power	P2157	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to power		Run/Crank Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ 5 Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Minimum Throttle Position Not Learned	P2176	TP sensors were not in the minimum learn window after multiple attempts to learn the minimum. Number of learn attempts >	During TPS min learn on the Main processor, TPS Voltage > 10 counts	0.88 Volts		Run/crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	2.0 secs	Type: A MIL: YES Trips: 1
Air Fuel Imbalance Bank 1	P219A	Determines if the air-fuel delivery system is imbalanced by monitoring the pre-catalyst O2 sensor voltage characteristics	The Bank 1 AFIM Filtered Length Ratio variable exceeds a value of	> 0.25	Run/Crank Voltage ECT Engine speed Mass Airflow PerCent Ethanol Delta O2 voltage during previous 12.5ms O2 sensor switches Quality Factor For DoD equipped vehicles only	*10 ≤ Volts ≤ 32 for > 4 seconds* > -20 ºC *1100 ≤ rpm ≤ 4000* *13 < g/s < 600* < 87 % > 5.000 and -5.000 > 2 times during current 2.5 second sample period > 0.95 in the current operating region No DoD state change during current 2.5 second sample period.	Frequency: Continuous Monitoring of O2 voltage signal in 12.5ms loop AFIM Filtered Length Ratio variable is updated after every 2.5 seconds of valid data.	Type B 2 Trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					The AFIM Filtered Length Ratio is determined by calculating the difference between the measured O2 voltage length (accumulated O2 voltage over a 2.5 second period) and an emissions-correlated threshold value, divided by the threshold value, and finally multiplied by a Quality Factor (the latter ranges between 0 and 1, based on robustness to false diagnosis in the current operating region). The resulting ratio is then filtered utilizing a first-order lag filter.			
					The first report is delayed for 25 seconds to allow time for the AFIM Filtered Length Ratio variable to saturate. This minimizes the possibility of reporting a pass before a potential failure could be detected.			
					Closed Loop fueling enabled A Function of Coolant Temperature based on Start-up coolant temp. and a function of Time also based on Start-up coolant temp. **Please see "Supporting Tables" Tab**			
					Fuel System Status	***LONG FT Enabled***		
					Disable Conditions:			
					EngineMisfireDetected_FA			
					MAP_SensorFA			
					MAF_SensorFA			
					ECT_Sensor_FA			
					Ethanol Composition Sensor FA			
					TPS_ThrottleAuthorityDefaulted			
					FuelInjectorCircuit_FA			
					AIR System FA			
					O2S_Bank_1_Sensor_1_FA			
					O2S_Bank_2_Sensor_1_FA			
					EvapPurgeSolenoidCircuit_FA			
					EvapFlowDuringNonPurge_FA			
					EvapVentSolenoidCircuit_FA			
					EvapSmallLeak_FA			
					EvapEmissionSystem_FA			
					FuelTankPressureSensorCircuit_FA			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Device Control	**Not Active**		
					Intrusive Diagnostics	**Not Active**		
					Engine OverSpeed Protection	**Not Active**		
					Reduced Power Mode (ETC DTC)	**Not Active**		
					PTO	**Not Active**		
					Traction Control	**Not Active**		
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 cannot achieve the rich threshold voltage. AND The Accumulated mass air flow monitored during the Stuck Lean Voltage Test is greater than the threshold before the above voltage threshold is met.	1) Post O2S signal < 740 mvolts AND 2) Accumulated air flow during stuck lean test > 60 grams.	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	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.	2 trips Type B
					B1S2 Failed this key cycle	P013A, P013B, P013E, P013F, P2270 or P2271		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria	
					ICAT MAT Burnoff delay	= Not Valid	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously.	
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Engine Speed to initially enable test	1250 ≤ RPM ≤ 2300		
					Engine Speed range to keep test enabled (after initially enabled)			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Airflow Vehicle Speed to initially enable test Vehicle Speed range to keep test enabled (after initially enabled) Closed loop integral Closed Loop Active Evap Ethanol Post fuel cell EGR Intrusive diagnostic All post sensor heater delays O2S Heater on Time Predicted Catalyst temp Fuel State	1100 ≤ RPM ≤ 2450 3 gps ≤ Airflow ≤ 12 gps 34.2 mph ≤ Veh Speed ≤ 74.6 mph 31.7 mph ≤ Veh Speed ≤ 79.5 mph 0.93 ≤ C/L Int ≤ 1.07 = TRUE not in control of purge not in estimate mode = enabled = not active = not active ≥ 120.0 sec 600 ºC ≤ Cat Temp ≤ 900 ºC = DFCO possible	(Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					All of the above met for at least 1.0 seconds, and then the Force Cat Rich intrusive stage is requested.			
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 cannot achieve the lean threshold voltage. AND The Accumulated mass air flow monitored during the Stuck Rich Voltage Test is greater than the threshold before the above voltage threshold is met.	1) Post O2S signal > 100 mvolts AND 2) Accumulated air flow during stuck rich test > 42 grams.	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = TRUE, multiple tests per trip are allowed.	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						EngineMisfireDetected_FA EthanolCompositionSensor_FA		
					B1S2 Failed this key cycle	P013A, P013B, P013E, P013F or P2270		
					Run/Crank Voltage	10.0 volts < Run/Crank Voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria	
					ICAT MAT Burnoff delay	= Not Valid	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Engine Speed	1250 ≤ RPM ≤ 2300		
					Engine Airflow	3 gps ≤ Airflow ≤ 12 gps		
					Vehicle Speed	34.2 mph ≤ Veh Speed ≤ 74.6 mph		
					Closed loop integral	0.93 ≤ C/L Int ≤ 1.07		
					Closed Loop Active	= TRUE		
					Evap	not in control of purge		
					Ethanol	not in estimate mode		
					Post fuel cell	= enabled		
					Power Take Off	= not active		
					EGR Intrusive diagnostic	= not active		
					All post sensor heater delays	= not active		
					O2S Heater on Time	≥ 120.0 sec		
					Predicted Catalyst temp	600 ºC ≤ Cat Temp ≤ 900 ºC		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Fuel State DTC's Passed DTC's Passed DTC's Passed	= DFCO possible = P2270 (and P2272 (if applicable)) = P013E (and P014A (if applicable)) = P013A (and P013C (if applicable))		
					After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).			
SIDI High Pressure Pump	P228C	Detects measured fuel rail pressure bias too low from desired fuel pressure.	Desired Pressure - Measure Pressure	≥ 3.00 Mpa	Run/Crank 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	11 ≤ Volts ≤ 32 > 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Pressure Error - 750 failures out of 938 samples	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active			
SIDI High Pressure Pump	P228D	Detects measured fuel rail pressure bias too high from desired fuel pressure	Desired Pressure - Measure Pressure	≤ -3.00 Mpa	Run/Crank 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	11 ≤ Volts ≤ 32 > 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Pressure Error - 750 failures out of 938 samples	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active			
Transmission Control Torque Request Circuit	P2544	Determines if the torque request from the TCM is valid	**Protect error** - Serial Communication message - ($199 - PTEI3)	Message <> two's complement of message			≥ 10 Protect errors during key cycle	2 trip(s)
			OR					
			Rolling count error - Serial Communication message ($199 - PPEI3) rolling count value	Message <> previous message rolling count value + one	Diagnostic enabled/disabled Power Mode Engine Running Run/Crank Active	Enabled = Run = True > 0.50 Sec	≥ 6 Rolling count errors out of ten samples	Type B
			OR					
			RAM error - Serial Communication message ($199 - PPEI3)	Transmission torque request value or request type dual store not equal			≥ 6 RAM errors out of 10 samples	
			OR					
			Range Error - Serial Communication message - ($199 - PTEI3) TCM Requested Torque Increase	> 250 Nm			≥ 6 out of 10 samples	
			OR					

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Multi-transition error - Trans torque intervention type request change	Requested torque intervention type toggles from not increasing request to increasing request			≥ 3 multi-transitions out of 5 samples Performed every 12.5 msec	
ECM/PCM Internal Engine Off Timer Performance	P2610	This DTC determines if the engine mode not running 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): Runs a mirror timer to the HWIO timer. The mirror timer is started when the Engine Mode Not Run Timer is started. When the engine starts or when a controller shutdown is requested, the HWIO timer and mirror timer are compared.	**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 at controller shutdown.	> 1.50 seconds > 25 %	IAT Temperature No active DTCs: **Count Up Test:** Ignition key off OR Engine off **Range Test:** ECM is powering down	-40 °C ≤ Temperature ≤ 80 °C IAT_SensorFA	**Count Up Test:** 8 failures out of 40 samples 1 sec / sample Continuous from key off or engine off until controller shutdown. **Range Test:** One time when the controller is powered down.	2 trips Type B DTC sets on next key cycle if failure detected.

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2Sensor Circuit Range/ Performance Bank 1 Sensor 1	P2A00	This DTC determines if the O2 sensor voltage is not meeting the voltage criteria to enable closed loop fueling.	Closed Loop O2S ready flag	= False	No Active DTC's	TPS_ThrottleAuthority Defaulted	200 failures out of 250 samples.	2 trips Type B
			A) O2S signal must be			MAP_SensorFA		
			O2S signal	< 1250 mvolts		ECT_Sensor_FA		
			To set Closed Loop ready flag	= True		FuelInjectorCircuit_FA		
						P0131, P0151	Frequency: Continuous	
						P0132, P0152		
						10.0 volts < Run/Crank Voltage< 32.0 volts	100msec loop	
			Closed Loop O2S ready flag	= True	Run/Crank Voltage			
			B) Once set to ready O2S cannot be			500 RPM ≤ Engine speed ≤ 3400 RPM		
					Engine Speed			
			O2S signal	> 1250 mvolts		3.2 gps ≤ Engine Airflow≤ 30.0 gps		
			for time	> 5.0 seconds	Engine Airflow			
			Then set Closed Loop ready flag		Engine Coolant	≥ 70.0 ºC		
				= False	Engine Metal Overtemp Active	= False		
					Converter Overtemp Active			
						= False		
					Fuel State	DFCO not active		
					AFM Status	= All Cylinders active		
					Predicted Exhaust Temp (B1S1)	≥ 0.0 ºC		
					Engine run time	> 100 seconds		
					Fuel Enrichment	= Not Active		
					All of the above met for			
					Time	> 5 seconds		
Control Module Communication Bus A Off	U0073	This DTC monitors for a BUS A off condition	Bus off failures	≥ 5 counts	CAN hardware is bus OFF for	≥ 0.0375 seconds	Diagnostic runs in 1000 ms loop	Type A 1 trips
			out of	≥ 5 samples				
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	12 counts	Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	The diagnostic runs in the 1000 ms loop	Type B 2 trips
			out of	12 samples	Power mode is RUN			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Communication bus is not OFF or is typed as a C code Normal Communication is enabled Normal Transmit capability is TRUE The diagnostic system is not disabled The bus has been on for A message has been selected to monitor.	> 3.0000 seconds		
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 out of	12 counts 12 samples	Run/Crank Voltage Power mode is RUN Communication bus is not OFF or is typed as a C code Normal Communication is enabled Normal Transmit capability is TRUE The diagnostic system is not disabled The bus has been on for A message has been selected to monitor.	11 volts ≤ Voltage ≤ 32 volts > 3.0000 seconds	The diagnostic runs in the 1000 ms loop	Type B 2 trips

P0442: EONV Pressure Threshold Table (in Pascals)

X axis is fuel level in %
Y axis is temperature in deg C

	0.0000	6.2499	12.4998	18.7497	24.9996	31.2495	37.4994	43.7493	49.9992	56.2491	62.4990	68.7490	74.9989	81.2488	87.4987	93.7486	99.9985
-10.0000	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
-4.3750	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
1.2500	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
6.8750	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
12.5000	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
18.1250	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
23.7500	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
29.3750	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
35.0000	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
40.6250	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
46.2500	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
51.8750	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
57.5000	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
63.1250	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
68.7500	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
74.3750	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905
80.0000	-435.9084	-435.9084	-435.9084	-435.9084	-420.3403	-400.8801	-381.4199	-361.9597	-342.4995	-323.0393	-303.5791	-284.1189	-264.6587	-249.0905	-249.0905	-249.0905	-249.0905

P0442: Estimate of Ambient Temperature Valid Conditioning Time

EAT Valid Conditioning Time (in seconds
Axis is Ignition Off Time (in seconds

Axis	Curve
0	400
600	400
1200	450
1800	500
2400	600
3000	550
3600	500
4200	400
4800	380
5400	350
6000	340
6600	320
7200	300
7800	200
8400	200
9000	200
9600	200
10200	200
10800	200
11700	200
12600	200
13500	100
14400	100
15300	100
16200	100
17100	100
18000	100
19200	100
20400	100
21600	100
22800	100
24000	100
25200	100

P0442: Engine Off Time Before Vehicle Off Maximum as a Function of Estimated Ambient Temperatur

Engine Off Time Before Vehicle Off Maximum Table (in seconds **Axis is Estimated Ambient Coolant in Deg C**

Axis	-10	-4	1	7	13	18	24	29	35	41	46	52	58	63	69	74	80
Curve	20	20	20	60	120	160	200	250	250	250	120	160	200	250	250	250	250

P0496: Purge Valve Leak Test Engine Vacuum Test Time (Cold Start) as a Function of Fuel Lev

Purge Valve Leak Test Engine Vacuum Test Time (in seconds
Axis is Fuel Level in %

Axis	Curve
0	68
6	67
12	66
19	65
25	64
31	64
37	63
44	62
50	61
56	60
62	59
69	58
75	57
81	56
87	55
94	54
100	53

P0461, P2066, P2636: Transfer Pump Enable

TransferPumpOnTimeLimit (in seconds
Axis is Fuel Level in %

Axis	Curve
0	0
3	0
6	0
9	0
13	0
16	0
19	0
22	0
25	0
28	0
31	0
34	0
38	0
41	0
44	0
47	0
50	0
53	0
56	0
59	0
63	0
66	0
69	0
72	0
75	0
78	0
81	0
84	0
88	0
91	0
94	0
97	0
100	0

P0114: IAT Intermittent Weight Factor

X axis is Filtered Intake Air Temperature in Deg C

Temp	-40	0	40	80	120	160	200
	1.00	1.00	1.00	1.00	1.00	1.00	1.00

P0101, P0106, P0121, P012B, P0236, P1101: IFRD Residual Weighting Factors

TPS Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.509	0.911	0.954	0.000	0.000	0.000

MAF Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	0.734	0.617	0.688	0.505	0.541	0.503	0.000	0.000	0.000

MAF Residual Weight Factor Based on MAF Estimat

gm/sec	0.0	50.0	70.0	73.0	76.0	79.0	82.0	85.0	89.0	95.0	100.0	110.0	120.0	150.0	200.0	280.0	350.0
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

MAP1 Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.000	1.000	0.871	1.000	1.000	1.000	1.000	0.762	0.869	1.000	0.729	1.000	1.000	0.000	0.000	0.000

MAP2 Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.000	0.559	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000

MAP3 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2700	3100	3200	3300	3500	3700	4000	4200	4500	5000	5250	5500	8000
	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

TIAP1 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2700	3100	3200	3300	3500	3700	4000	4200	4500	5000	5250	5500	8000
	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

SCIAP1 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2800	3100	3200	3300	3500	3700	4000	4200	4500	5000	5500	6500	8000
	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

SCIAP2 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2800	3100	3200	3300	3500	3700	4000	4200	4500	5000	5500	6500	8000
	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

Boost Residual Weight Factor based on % of Boos

% Boost	0.00	0.06	0.13	0.19	0.25	0.31	0.38	0.44	0.50	0.56	0.63	0.69	0.75	0.81	0.88	0.94	1.00
	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

P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Offset based on RPM

RPM	1000	1750	2500	3250	4000	4750	5500	6250	7000
	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min Air Flow based on RPM

RPM	1000	1750	2500	3250	4000	4750	5500	6250	7000
	17.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0

P0101, P0106, P0121, P0236, P1101: TIAP-MAP Correlation Min MAP based on RPM

RPM	1000	1750	2500	3250	4000	4750	5500	6250	7000
	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0

P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Offset based on RPM

RPM	1000	1750	2500	3250	4000	4750	5500	6250	7000
	0.0	1.5	3.5	6.0	9.0	12.0	16.0	20.0	25.0

P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max Air Flow based on RPM

RPM	1000	1750	2500	3250	4000	4750	5500	6250	7000
	5.0	9.0	13.0	16.0	20.0	24.0	28.0	31.0	32.0

P0101, P0106, P0121, P0236, P1101: TIAP-Baro Correlation Max MAP based on RPM

RPM	1000	1750	2500	3250	4000	4750	5500	6250	7000
	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0

P0324/P0326 Abnormal Noise Threshold (same table used for both)

	X-axis: Engine Air Flow (mg per cylinder)			
Y-axis: Engine Speed (RPM)	100	300	700	1200
500	0.0000	0.0000	0.0000	0.0000
1000	0.0000	0.0000	0.0000	0.0000
1500	0.0000	0.0000	0.0000	0.0000
2000	0.0000	0.0000	0.0000	0.0000
2500	0.0000	0.0000	0.0000	0.0000
3000	0.0000	0.0000	0.0000	0.0000
3500	0.0000	0.0000	0.0000	0.0000
4000	0.0000	0.0000	0.0000	0.0000
4500	0.0000	0.0000	0.0000	0.0000
5000	0.0000	0.0000	0.0000	0.0000
5500	0.0000	0.0000	0.0000	0.0000
6000	0.0000	0.0000	0.0000	0.0000
6500	0.0000	0.0000	0.0000	0.0000
7000	0.0000	0.0000	0.0000	0.0000
7500	0.0000	0.0000	0.0000	0.0000
8000	0.0000	0.0000	0.0000	0.0000
8500	0.0000	0.0000	0.0000	0.0000

P0325/P0330

Two methods are used for the Knock Sensor Open Circuit Diagnostic:

1) 20 kHz Method: 20 kHz signal is internally injected on one sensor line (Signal) and the output of the differential op-amp is checked to verify the 20 kHz travels through the sensor and back to
2) Normal Noise: The amplitude of the FFT (in the knock frequency range) is checked to verify there is a knock signal within an expected ran

KtKNKD_e_OpenMethod is the cal table used to determine which Open Circuit method is used: '0' = Disabled; '1' = 20 kHz Method; '2' = Normal Noise Meth

X-axis: Engine Air Flow (mg per cylinder

Y-axis: Engine Speed (RPM)	100	300	700	1200
500	1	1	1	1
1000	1	1	1	1
1500	1	1	1	1
2000	1	1	1	1
2500	1	1	1	1
3000	1	1	1	1
3500	1	1	1	1
4000	1	1	1	1
4500	1	1	1	1
5000	1	1	1	1
5500	2	2	2	2
6000	2	2	2	2
6500	2	2	2	2
7000	2	2	2	2
7500	2	2	2	2
8000	2	2	2	2
8500	2	2	2	2

Open Circuit Thresholds:

1. 20 kHz Method:

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenCktThrshMin:	2.2637	2.3032	2.2908	2.2327	2.1348	2.0039	1.8464	1.6682	1.4758	1.2756	1.0740	0.8772	0.6914	0.5232	0.3787	0.2642	0.1863

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenCktThrshMax:	5.4063	5.5120	5.4968	5.3755	5.1631	4.8748	4.5254	4.1301	3.7041	3.2622	2.8193	2.3906	1.9910	1.6357	1.3398	1.1179	0.9856

2. Normal Noise Method:

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenCktThrshMin:	0.0000	0.0000	0.0000	0.0000	0.0071	0.0432	0.0664	0.0793	0.0852	0.0869	0.0874	0.0896	0.0964	0.1108	0.1360	0.1748	0.2302

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenCktThrshMax:	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.1401	0.2021	0.2292	0.2361	0.2375	0.2490	0.2849	0.3606	0.4907	0.6902	0.9741

P06B6/P06B7

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenTestThreshLc	0.0161	0.0134	0.0193	0.0317	0.0442	0.0781	0.1089	0.1436	0.1816	0.2219	0.2639	0.3064	0.3489	0.3904	0.4299	0.4668	0.5000

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenTestThreshHi	0.0334	0.0349	0.0530	0.0876	0.1301	0.2078	0.3015	0.4019	0.5068	0.6296	0.8064	1.1030	1.6233	2.5168	3.9854	6.2915	9.7664

KtOXYD_cmp_AFIM_LngthThrsh1

AvgFlow / AvgRPM	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500	4000	4500	5000	6000
40	75008	75008	75008	14928	75008	75008	13360	12848	13184	13200	11216	17504	18160	13184	75008	75008	75008
80	75008	75008	14928	14928	19088	18960	13360	12848	13184	13200	11216	17504	18160	13184	13184	75008	75008
120	75008	75008	15472	15472	19088	18960	21168	22544	23936	14672	16800	20768	20432	20368	20368	75008	75008
160	75008	75008	18784	18784	28112	26688	23728	24656	21168	22304	19856	22944	15248	16352	16352	75008	75008
200	75008	75008	17984	17984	21632	25616	21584	20944	26192	23712	18448	17584	18800	23760	23760	75008	75008
240	75008	75008	18592	18592	20480	21888	16096	18304	22896	23088	20320	21616	22400	23376	23376	75008	75008
280	75008	75008	17312	17312	18576	21232	17728	20544	24896	23648	14752	17936	19216	23376	75008	75008	75008
320	75008	75008	18256	18256	18096	21056	18144	19936	24960	22736	17680	18160	22000	75008	75008	75008	75008
360	75008	75008	18640	18640	18608	22640	16816	18320	24816	22320	16880	18160	22000	75008	75008	75008	75008
400	75008	75008	17152	17152	16560	19328	21504	18304	21392	20992	16464	16464	75008	75008	75008	75008	75008
440	75008	75008	75008	16016	16016	18448	19552	20048	21360	26352	23088	23088	75008	75008	75008	75008	75008
480	75008	75008	14560	14560	15440	17616	18576	17488	21360	26352	23088	75008	75008	75008	75008	75008	75008
520	75008	75008	75008	75008	15440	16016	18016	15104	15104	75008	75008	75008	75008	75008	75008	75008	75008
560	75008	75008	75008	75008	75008	16016	16240	15104	75008	75008	75008	75008	75008	75008	75008	75008	75008
640	75008	75008	75008	75008	75008	75008	16240	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008
720	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008
800	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008

KtOXYD_cmp_AFIM_LngthThrsh2

AvgFlow / AvgRPM	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500	4000	4500	5000	6000
40	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
120	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
160	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
240	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
280	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
320	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
360	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
400	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
440	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
480	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
520	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
640	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
720	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
800	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_K_AFIM_QualFactor1

AvgFlow / AvgRPM	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500	4000	4500	5000	6000
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	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	0.00
160	0.00	0.00	0.00	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	0.00
200	0.00	0.00	0.00	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	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	0.00	0.00	0.00	0.00	0.00
280	0.00	0.00	0.00	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	0.00
320	0.00	0.00	0.00	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	0.00
360	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
400	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	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	1.00	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
720	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

KtOXYD_K_AFIM_QualFactor2

AvgFlow / AvgRPM	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500	4000	4500	5000	6000
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
80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
120	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
160	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
200	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
240	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
280	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
320	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
360	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
400	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
440	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
480	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
520	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
560	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
640	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
720	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
800	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Define Close Loop Enable Conditions

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	0.0	0.0	0.0	0.0	19.0	19.0	19.0	19.0	19.0	19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

The following table defines the Long Fuel Trim cells utilized for FASD diagnosis (cells identified with a "Yes" are enabled, and with a "NO" are disabled)

Long-Term Fuel Trim Cell Usage

Cell I.D.	CeFADR_e_Cell00_PurgOnAirMode5	CeFADR_e_Cell01_PurgOnAirMode4	CeFADR_e_Cell02_PurgOnAirMode3	CeFADR_e_Cell03_PurgOnAirMode2	CeFADR_e_Cell04_PurgOnAirMode1	CeFADR_e_Cell05_PurgOnAirMode0	CeFADR_e_Cell06_PurgOnIdle	CeFADR_e_Cell07_PurgOnDecel	CeFADR_e_Cell08_PurgOffAirMode5	CeFADR_e_Cell09_PurgOffAirMode4	CeFADR_e_Cell10_PurgOffAirMode3	CeFADR_e_Cell11_PurgOffAirMode2	CeFADR_e_Cell12_PurgOffAirMode1	CeFADR_e_Cell13_PurgOffAirMode0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
FASD Cell Usage	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_NonSelectedCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_NonSelectedCell
FASD Enabled In Cell?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO

P00B6: Fail if power up ECT exceeds RCT by these values

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

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

P0116: Fail if power up ECT exceeds IAT by these values

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

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

P0128: Maximum Accumulated Airflow for IAT and Start-up ECT condition

Z axis is the accumulated airflow failure threshold (grams)
X axis is ECT Temperature at Power up (° C)
Y axis is IAT min during test (° C)

	IAT Range Low	IAT Range Hi	-40	-28	-16	-4	8	20	32	44	56	68	80
Primary	10.0 ° C	52.0 ° C	12407	11219	10031	8843	7655	6467	5279	4091	2920	1756	592
Alternate	-7.0 ° C	10.0 ° C	14563	13183	11803	10423	9043	7663	6283	4903	3523	2143	763

P0300-P0308: Idle SCD (decel index (> Idle SCD AND > Idle SCD ddt Tables)

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
Load 9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
60	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

P0300-P0308: Idle SCD ddt

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
60	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

P0300-P0308: SCD Delta **OR** (decel index >SCD Delta **AND** > SCD Delta ddt Tables))

Load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
60	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

P0300-P0308: SCD Delta ddt

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
60	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

P0300-P0308: Idle Cyl Mode **OR** (decel index (>Idle Cyl Mode **AND** > Idle Cyl Mode ddt Tables)

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	2000	2000	2000	1100	1100	700	600	450	250	160	75	60	50
9	2000	2000	2000	1200	1125	700	450	425	250	160	100	60	60
11	2000	2000	2000	1600	1000	700	450	350	275	160	100	60	60
12	2000	2000	2000	1600	1000	750	550	500	300	160	100	60	60
13	2000	2000	2000	1600	1000	750	550	500	300	160	100	75	70
15	2000	2000	2000	1600	1000	800	550	500	350	225	125	85	70
17	2000	2000	2000	1700	1000	800	600	500	450	225	150	100	80
19	2000	2000	2000	1700	1000	800	700	600	450	250	175	120	100
22	2000	2000	2000	1700	1040	970	750	600	550	350	200	130	100
25	3500	3500	3500	2150	1200	1200	800	900	600	500	300	150	120
29	3500	3500	3500	2400	1400	1600	800	800	650	500	350	160	135
33	4500	4500	4500	3000	1800	1800	1000	800	650	550	350	200	150
38	4500	4500	4500	3500	2000	1800	1100	1000	700	600	400	250	180
42	5000	5000	5000	4000	3000	2500	1500	1400	1000	750	400	300	210
48	5500	5500	5500	4500	3500	3000	2500	2000	1400	700	500	350	260
54	6000	6000	6000	5000	4000	3500	2500	2500	1600	700	500	400	300
60	6500	6500	6500	5500	4500	4000	3000	3000	2000	800	600	450	350

P0300-P0308: Idle Cyl Mode ddt

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	2000	2000	2000	1200	1200	700	600	840	400	300	175	80	115
9	2000	2000	2000	1200	1100	700	600	450	450	275	175	90	100
11	2000	2000	2000	1500	1100	800	800	500	475	275	200	120	90
12	2000	2000	2000	1500	1200	900	800	575	475	275	180	120	80
13	2000	2000	2000	1500	1200	1000	800	575	400	200	180	130	90
15	2000	2000	2000	1600	1400	1300	800	575	450	375	200	145	110
17	2000	2000	2000	2100	1500	1300	800	700	600	400	225	170	125
19	2000	2000	2000	2200	2000	1300	900	1000	600	450	275	200	175
22	2400	2400	2400	2500	2100	1800	1300	1000	750	500	310	225	200
25	3800	3800	3800	2500	2100	2500	1300	1200	950	650	475	275	250
29	4000	4000	4000	3400	2600	3000	1300	1200	950	650	475	325	250
33	5500	5500	5500	4000	3500	3800	1600	1300	950	675	500	400	300
38	6000	6000	6000	4500	3500	3800	1800	1500	1050	750	525	500	350
42	8000	8000	8000	5000	4000	4000	2400	2000	1400	750	625	500	400
48	9000	9000	9000	5500	5000	5000	3000	2500	2000	800	700	650	500
54	9000	9000	9000	6000	5500	5500	3500	3000	2200	1200	750	650	600
60	9500	9500	9500	6500	6000	6000	4000	3500	2600	1200	800	700	650

P0300-P0308: Cyl Mode

OR (decel index > Cyl Mode AND > Cyl Mode ddt Tables)

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3500	4000	4500	5000	5500	6000	6500	7000
7	1800	1800	1800	1100	1100	700	600	450	250	160	75	60	50	38	30	20	20	20	12	22	12	13	11	10	8	7
9	1800	1800	1800	1200	1125	700	450	425	250	160	100	60	60	40	40	25	22	22	12	10	11	12	7	10	8	7
11	1800	1800	1800	1600	1000	700	450	350	250	160	100	60	60	40	40	25	22	20	13	10	10	10	7	7	8	7
12	1800	1800	1800	1600	1000	750	550	400	300	160	100	60	60	40	40	30	25	20	15	10	9	7	7	7	7	7
13	1800	1800	1800	1600	1000	750	550	400	300	160	100	75	70	50	40	35	30	25	17	11	9	6	6	7	7	7
15	1800	1800	1800	1600	1000	800	550	400	350	180	125	85	70	50	45	40	30	30	19	12	9	6	5	7	7	7
17	1800	1800	1800	1700	1000	800	600	400	350	225	150	100	80	55	50	45	35	30	20	12	10	7	6	7	7	7
19	1800	1800	1800	1700	1000	800	700	550	400	250	175	120	100	65	55	50	45	40	24	15	10	8	6	6	7	7
22	1800	1800	1800	1700	1040	970	750	600	450	250	200	130	100	75	70	55	50	40	25	17	11	9	7	7	7	7
25	3500	3500	3500	2150	1200	1200	800	750	550	250	250	150	120	95	80	65	55	50	30	19	12	10	8	7	7	7
29	3500	3500	3500	2400	1400	1600	800	800	700	375	250	160	135	110	90	75	60	50	32	22	17	12	8	8	7	7
33	4500	4500	4500	3000	1800	1800	1000	900	700	400	250	200	150	120	100	85	70	60	35	25	17	13	10	8	7	7
38	4500	4500	4500	3500	2000	1800	1100	1000	800	600	350	250	180	145	120	100	80	70	45	27	20	15	11	9	7	7
42	5000	5000	5000	4000	3000	2500	1500	1400	1000	600	375	300	210	160	135	125	100	80	50	35	25	17	13	11	8	8
48	5500	5500	5500	4500	3500	3000	2500	2000	1400	600	500	350	260	225	175	125	100	80	60	40	26	19	15	13	9	9
54	6000	6000	6000	5000	4000	3500	2500	2500	1600	700	500	400	300	220	175	150	125	100	70	45	31	22	18	14	14	14
60	6500	6500	6500	5500	4500	4000	3000	3000	2000	800	600	450	350	275	185	175	145	145	80	65	35	24	20	16	15	15

P0300-P0308: Cyl Mode ddt

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3500	4000	4500	5000	5500	6000	6500	7000
7	1400	1400	1400	1200	1200	700	600	840	400	300	175	80	115	65	55	40	40	30	22	22	13	13	11	10	12	12
9	1400	1400	1400	1200	1100	700	600	450	450	275	175	90	100	65	60	45	35	30	20	14	14	12	10	10	12	12
11	1500	1500	1500	1500	1100	800	800	500	475	275	200	120	90	70	60	45	35	25	23	16	14	10	10	10	11	11
12	1800	1800	1800	1300	1200	900	800	575	475	275	180	120	80	70	60	45	35	33	24	18	14	11	10	10	11	11
13	1800	1800	1800	1400	1200	1000	800	575	500	275	180	130	90	70	60	50	40	35	27	20	14	11	10	10	11	11
15	1800	1800	1800	1600	1400	1300	800	575	500	300	200	145	110	85	80	75	50	40	27	22	15	12	10	10	11	11
17	1800	1800	1800	2100	1500	1300	800	700	600	300	225	170	125	110	90	75	50	40	30	24	18	13	10	11	10	10
19	2000	2000	2000	2200	2000	1300	900	1000	600	450	275	200	175	135	110	100	60	60	30	27	18	15	12	11	10	10
22	2400	2400	2400	2500	2100	1800	1300	1000	750	500	310	225	200	150	150	125	80	70	35	27	25	17	13	11	10	10
25	3800	3800	3800	2500	2100	2500	1300	1300	1000	800	475	275	250	200	180	125	110	100	45	42	30	20	16	13	10	10
29	4000	4000	4000	3400	2600	3000	1300	1300	1200	800	475	325	250	250	225	140	125	110	55	50	35	25	20	15	11	11
33	5500	5500	5500	4000	3500	3800	1600	1400	1200	800	500	400	300	250	225	175	150	125	65	60	40	30	22	17	13	13
38	6000	6000	6000	4500	3500	3800	1800	1500	1200	1200	525	500	350	350	225	200	200	125	75	60	50	40	30	19	14	14
42	8000	8000	8000	5000	4000	4000	2400	2000	1400	1200	625	500	400	350	300	200	200	175	85	70	60	40	35	22	16	16
48	9000	9000	9000	5500	5000	5000	3000	2500	2000	1200	700	650	500	450	300	225	220	175	100	90	65	45	40	24	20	20
54	9000	9000	9000	6000	5500	5500	3500	3000	2200	1200	750	650	600	450	350	300	250	200	125	100	70	55	45	35	25	25
60	9500	9500	9500	6500	6000	6000	4000	3500	2600	1200	800	700	650	450	350	300	250	200	150	125	75	55	45	35	27	27

P0300-P0308: Rev Mode Table

OR (decel index > Rev Mode Table)

load	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3500	4000	4500	5000	5500	6000	6500	7000	4000	4500	5000	5500	6000	6500	7000
7	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	23	20	15	11	10	10	35	30	26	16	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	26	20	15	14	11	11	38	32	25	18	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32	24	17	14	11	11	40	32	24	22	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	34	26	17	17	13	13	45	32	26	22	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	40	30	20	18	15	15	50	40	28	24	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	45	35	25	20	16	16	55	45	34	26	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	50	35	25	22	17	17	65	55	40	32	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	55	40	30	25	20	20	80	60	45	35	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	60	50	35	30	24	22	90	70	50	40	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	70	50	40	30	26	25	100	80	60	48	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	85	60	45	40	30	27	115	95	70	55	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	95	70	50	40	35	30	130	110	85	65	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	110	80	60	50	35	35	140	125	95	75	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	125	100	70	55	45	40	150	140	110	85	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	140	100	80	60	50	45	180	160	120	100	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	140	110	90	70	55	50	200	180	135	120	32767	32767	32767
60	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	165	110	100	80	65	60	225	200	150	140	32767	32767	32767

P0300-P0308: Zero torque engine load

Zero Torque: All Cylinders active

RPM	Pct load
400	12.00
500	10.00
600	8.50
700	8.50
800	8.50
900	8.50
1000	8.50
1100	8.00
1200	8.00
1400	8.00
1600	8.00
1800	8.00
2000	8.00
2200	8.00
2400	8.00
2600	8.00
2800	8.00
3000	9.00
3500	11.37
4000	16.07
4500	18.47
5000	20.87
5500	23.27
6000	25.67
6500	28.07
7000	30.00

Baro KPa	Multiplier
65	0.82
70	0.85
75	0.88
80	0.90
85	0.93
90	0.95
95	0.97
100	1.00
105	1.03

Zero Torque: Active Fuel Management (AFM

RPM	Pct load
400	200.00
500	200.00
600	200.00
700	200.00
800	200.00
900	200.00
1000	200.00
1100	200.00
1200	200.00
1400	200.00
1600	200.00
1800	200.00
2000	200.00
2200	200.00
2400	200.00
2600	200.00
2800	200.00
3000	200.00
3500	200.00
4000	200.00
4500	200.00
5000	200.00
5500	200.00
6000	200.00
6500	200.00
7000	200.00

Note: Zero torque is adjusted for Baro. Misfire thresholds are relative to (maximum air density PID $1188 SAE xxx) and do not shift appreciably with altitude compared to (current density as defined PID $04 SAE1979)

Catalyst Damaging Misfire Percentage

load	0	1000	2000	3000	4000	5000	6000	7000
0	22	22	20	17	5	5	5	5
10	22	22	20	17	5	5	5	5
20	22	22	20	17	5	5	5	5
30	20	20	17	12	5	5	5	5
40	16	16	14	10	5	5	5	5
50	14	14	9	5	5	5	5	5
60	5	5	5	5	5	5	5	5
70	5	5	5	5	5	5	5	5
80	5	5	5	5	5	5	5	5
90	5	5	5	5	5	5	5	5
100	5	5	5	5	5	5	5	5

P0133 - O2S Slow Response Bank 1 Sensor 1" Pass/Fail Threshold tabl

Z axis is the pass/fail result (see note below)
X axis is Lean to Rich response time (msec)
Y axis is Rich to Lean response time (msec)
Note: If the cell contains a "0" then the fault is not indicated, if it contains a "1" a fault is indicated

	0.000	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090	0.100	0.110	0.120	0.130	0.140	0.150	0.160	1.000
0.000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
0.020	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
0.030	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
0.040	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
0.050	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
0.060	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
0.070	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
0.080	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
0.090	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.130	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.140	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.150	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0
0.160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P1133 - O2S HC L to R Switches Limit Bank 1 Sensor 1" Pass/Fail Threshold tabl

Z axis is Limit for L/R HC switches
Y axis is Average flow during the response test (gps)
X axis is estimated Ethanol percentage
Note: The cell contains the minumum switches

	0.0	10.0	20.0	50.0	80.0
0.0	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	32	32	32	32	32
25.0	32	32	32	32	32
31.3	32	32	32	32	32
37.5	32	32	32	32	32
43.8	32	32	32	32	32
50.0	32	32	32	32	32
56.3	32	32	32	32	32
62.5	32	32	32	32	32
68.8	32	32	32	32	32
75.0	32	32	32	32	32
81.3	32	32	32	32	32
87.5	32	32	32	32	32
93.8	32	32	32	32	32
100.0	32	32	32	32	32

P1133 - O2S HC R to L Switches Limit Bank 1 Sensor 1" Pass/Fail Threshold tabl

Z axis is Limit for R/L HC switches
Y axis is Average flow during the response test (gps)
X axis is estimated Ethanol percentage
Note: The cell contains the minumum switches

	0.0	10.0	20.0	50.0	80.0
0.0	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	32	32	32	32	32
25.0	32	32	32	32	32
31.3	32	32	32	32	32
37.5	32	32	32	32	32
43.8	32	32	32	32	32
50.0	32	32	32	32	32
56.3	32	32	32	32	32
62.5	32	32	32	32	32
68.8	32	32	32	32	32
75.0	32	32	32	32	32
81.3	32	32	32	32	32
87.5	32	32	32	32	32
93.8	32	32	32	32	32
100.0	32	32	32	32	32

P0016: Cam Correlation Oil Temperature Threshold

X axis is Engine Oil Temperature in Deg C

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

MinimumEngineRunTime

Coolant Temp	40	50	60	70	80
Engine Run Time	100	100	100	100	100

MinAirflowToWarmCatalyst

Engine Coolant	0	45	90
MinAirFlowToWrmCat	10	9	8

KtPHSD_phi_CamPosErrorLimIc1

X axis is Deg C
Y axis is RPM

	-40.0000	-28.0000	-16.0000	-4.0000	8.0000	20.0000	32.0000	44.0000	56.0000	68.0000	80.0000	92.0000	104.0000	116.0000	128.0000	140.0000	152.0000
400	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
800	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
1200	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
1600	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
2000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
2400	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
2800	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
3200	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
3600	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
4000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
4400	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
4800	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
5200	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
5600	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
6000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
6400	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
6800	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000

KtPHSD_phi_CamPosErrorLimEc1

X axis is Deg C
Y axis is RPM

	-40.0000	-28.0000	-16.0000	-4.0000	8.0000	20.0000	32.0000	44.0000	56.0000	68.0000	80.0000	92.0000	104.0000	116.0000	128.0000	140.0000	152.0000
400	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
800	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
1200	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
1600	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
2000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
2400	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
2800	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
3200	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
3600	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
4000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
4400	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
4800	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
5200	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
5600	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
6000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
6400	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
6800	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000

KtPHSD_t_StablePositionTimeIc1

X axis is Deg C
Y axis is RPM

	-40.0000	-28.0000	-16.0000	-4.0000	8.0000	20.0000	32.0000	44.0000	56.0000	68.0000	80.0000	92.0000	104.0000	116.0000	128.0000	140.0000	152.0000
400	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
800	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
1200	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
1600	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
2000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
2400	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
2800	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
3200	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
3600	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
3600	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
4400	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
4800	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
5200	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
5600	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
6000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
6400	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
6800	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000

KtPHSD_t_StablePositionTimeEc1

X axis is Deg C
Y axis is RPM

	-40.0000	-28.0000	-16.0000	-4.0000	8.0000	20.0000	32.0000	44.0000	56.0000	68.0000	80.0000	92.0000	104.0000	116.0000	128.0000	140.0000	152.0000
400	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
800	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
1200	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
1600	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
2000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
2400	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
2800	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
3200	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
3600	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
4000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
4400	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
4800	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
5200	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
5600	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
6000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
6400	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
6800	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000

P0068: MAP / MAF / TPS Correleation

X-axis is TPS (%)
Data is MAP threshold (kPa)

X-axis	5.0003	10.0006	14.9994	19.9997	25.0000	30.0003	35.0006	39.9994	99.9985
Data	29.0000	35.1016	33.2969	32.5000	27.7031	24.7031	100.0000	100.0000	100.0000

X axis is TPS (%)
Data is MAF threshold (grams/sec)

X-axis	5.0003	10.0006	14.9994	19.9997	25.0000	30.0003	35.0006	39.9994	99.9985
Data	9.1016	14.5000	16.7031	21.7969	24.1016	28.7031	255.0000	255.0000	255.0000

X axis is Engine Speed (RPM)
Data is max MAF vs RPM (grams/sec)

X-axis	600.0000	1400.0000	2200.0000	3000.0000	3800.0000	4600.0000	5400.0000	6200.0000	7000.0000
Data	17.8984	39.1875	63.4297	80.9141	112.9219	138.3125	168.7031	174.2031	176.7031

X axis is Battery Voltage (V)
Data is max MAF vs Voltage (grams/sec)

X-axis	6.0000	7.0000	8.0000	9.0000	10.0000	11.0000	12.0000	13.0000	14.0000
Data	1.4844	1.9531	13.7422	42.6719	102.6719	205.2422	300.7031	300.7031	300.7031

P1682: Ignition Voltage Correleatior

X-axis is IAT (DegC)
Data is Voltage threshold (V)

X-axis	23.0000	85.0000	95.0000	105.0000	125.0000
Data	7.0000	8.6992	9.0000	9.1992	10.0000

P0606 — **Processor Performance Check - ETC software is not executed in proper order**

X-axis is task loop time
Data is threshold (seconds)

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	0.2000	0.2000	0.2000

X-axis is task loop time
Data is threshold (seconds)

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	0.2000	0.2000	0.2000

X-axis is task loop time
Data indicates if feature is enabled

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	1.0000	1.0000	0.0000

P16F3

P16F3: No fast unmanaged retarded spark above the applied spar

X-axis is Erpm
Y-axis is Air per Clyinder (mg)
Data is spark delta threshold (kPa)

KtSPRK_phi_DeltTorqueScrtyAdv

APC/Erpm	500.00	980.74	1461.48	1942.23	2422.97	2903.71	3384.45	3865.20	4345.94	4826.68	5307.42	5788.16	6268.91	6749.65	7230.39	7711.13	8191.88
80.00	37.70	29.22	47.61	55.19	64.38	72.75	69.09	65.23	61.02	55.73	49.66	43.14	36.91	40.56	42.47	42.47	42.47
160.00	36.20	29.55	38.84	41.86	47.19	52.22	49.89	46.69	41.83	38.38	35.95	32.78	29.72	33.45	35.41	35.41	35.41
240.00	34.81	30.08	32.91	32.52	33.55	34.69	33.11	31.61	30.22	29.09	28.17	26.38	24.59	28.33	30.28	30.28	30.28
320.00	33.53	30.77	28.59	26.61	25.67	25.08	24.28	23.73	23.64	23.05	22.06	21.41	20.97	24.42	26.22	26.22	26.22
400.00	32.34	31.61	25.05	22.45	20.86	19.61	19.16	19.02	19.44	19.02	17.97	17.61	17.53	20.36	21.83	21.83	21.83
480.00	30.88	32.36	22.25	19.42	17.58	16.11	15.83	15.83	16.38	16.06	15.14	14.89	14.88	17.36	18.66	18.66	18.66
560.00	28.38	30.48	20.03	17.11	15.22	13.66	13.48	13.55	14.08	13.86	13.08	12.89	12.94	15.14	16.30	16.30	16.30
640.00	26.25	28.83	18.23	15.28	13.42	11.86	11.73	11.84	12.34	12.17	11.50	11.36	11.44	13.42	14.45	14.45	14.45
720.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14
800.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14
880.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14
960.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14
1040.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14
1120.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14
1200.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14
1280.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14
1360.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19	13.14	13.14	13.14

P16F3: Absolute difference of the calculated Intake Manifold Pressure during engine event versus during time eve

X-axis is engine torque (Nm)
Data is MAP delta threshold (kPa)

X-axis	0.0000	50.0000	100.0000	150.0000	200.0000	300.0000
Data	24.7031	24.7031	24.7031	24.7031	24.7031	24.7031

P16F3: Table to calc limit for predicted torque for zero pedal determination

X-axis is engine oil temp in C deg
Y-axis is engine speed RPM
Data is Torque (Nm)

	-40.0000	-20.0000	-10.0000	0.0000	50.0000	90.0000
200.0000	4096.0000	4096.0000	4096.0000	4096.0000	4096.0000	4096.0000
375.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
525.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
625.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
725.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
925.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
1125.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
1325.0000	25.0000	25.0000	20.0000	15.0000	5.0000	5.0000
1525.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1725.0000	-0.5000	-5.0000	-8.0000	-10.0000	-12.7500	-12.7500
2325.0000	-2.7500	-7.2500	-10.0000	-12.2500	-15.0000	-15.0000
2925.0000	-4.7500	-9.2500	-12.2500	-14.2500	-17.2500	-17.2500
3525.0000	-4.0000	-8.5000	-11.5000	-13.5000	-16.5000	-16.5000
4125.0000	-2.5000	-7.0000	-9.7500	-12.0000	-14.7500	-14.7500
4725.0000	-0.7500	-5.2500	-8.2500	-10.5000	-13.2500	-13.2500
5325.0000	-2.0000	-6.5000	-9.5000	-11.5000	-14.2500	-14.2500
7000.0000	-6.7500	-11.2500	-14.2500	-16.2500	-19.0000	-19.0000

P00C6 **KtFHPD_p_HPS_PressFallLoThrsh**

Coolant Axis

Eth %	**-40**	**-32**	**-24**	**-16**	**-8**	**0**	**8**	**16**	**20**	**24**	**32**	**40**	**48**	**64**	**80**	**96**	**112**
0.0000	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
12.5000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
25.0000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
37.5000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
50.0000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
62.5000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
75.0000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
87.5000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
100.0000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0

P00C6 KtFHPD_Cnt_HPS_PressFallLoThrsh

Coolant Axis

Eth %	-40	-32	-24	-16	-8	0	8	16	20	24	32	40	48	64	80	96	112
0.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
12.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
25.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
37.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
50.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
62.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
75.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
87.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
100.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

P00C6 KtFHPC_p_HighPressStart

Coolant Axis

Eth %	-40	-32	-24	-16	-8	0	8	16	20	24	32	40	48	64	80	96	112
0.0000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1
12.5000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1
25.0000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1
37.5000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1
50.0000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1
62.5000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1
75.0000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1
87.5000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1
100.0000	8	8	6	4	3	1	1	1	1	1	1	1	1	1	1	1	1

P00C6 KtFHPC_t_HighPressStartTmout

Coolant Axis

-40	-32	-24	-16	-8	0	8	16	20	24	32	40	48	64	80	96	112
5.0	5.0	5.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

P0089
P163A
P228C
P228D
P0191 KtFHPD_t_PumpCntrlEngRunThrsh

-30	-20	-10	0	10	20	80	100	110
60.0	60.0	40.0	10.0	10.0	10.0	20.0	40.0	60.0

P0191 KtFHPD_t_SnsPrfStuckCrankTmout

-30	-20	-10	0	10	20	80	100	110
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Cert Doc Bundle Name	**Pcodes**																		
CatalystSysEfficiencyLoB1_FA	P0420																		
CatalystSysEfficiencyLoB2_FA	P0430																		
EvapPurgeSolenoidCircuit_FA	P0443																		
EvapFlowDuringNonPurge_FA	P0496																		
EvapVentSolenoidCircuit_FA	P0449																		
EvapSmallLeak_FA	P0442																		
EvapEmissionSystem_FA	P0455	P0446																	
FuelTankPressureSnsrCkt_FA	P0452	P0453																	
CoolingFanSpeedTooHigh_FA	P0495																		
FuelLevelDataFault	P0461	P0462	P0463	P2066	P2067	P2068													
PowertrainRelayFault	P1682																		
PowertrainRelayStateOn_FA	P0685																		
PowertrainRelayStateOn_Error	P0685																		
IgnitionOffTimer_FA	P2610																		
GetPMDR_b_IgnOffTmeVld	IgnitionC	P2610																	
GetEPSR_TmSinceEngRunningValid	TimeSin	P2610																	
VehicleSpeedSensor_FA	P0502	P0503	P0722	P0723															
See Trans Summary Table																			
FuelTrimSystemB1_FA	P0171	P0172																	
FuelTrimSystemB2_FA	P0174	P0175																	
FuelTrimSystemB1_TFTKO	P0171	P0172																	
FuelTrimSystemB2_TFTKO	P0174	P0175																	
A/F Imbalance Bank1	P1174 o	P219A																	
A/F Imbalance Bank2	P1175 o	P219B																	
AIRSystemPressureSensor FA	P2430	P2431	P2432	P2433	P2435	P2436	P2437	P2438											
AIR System FA	P0411	P2440	P2444																
AIRValveControlCircuit FA	P0412																		
AIRPumpControlCircuit FA	P0418																		
Clutch Sensor FA	P0806	P0807	P0808																
ClutchPositionSensorCircuitLo FA	P0807																		
ClutchPositionSensorCircuitHi FA	P0808																		
Ethanol Composition Sensor FA	P0178	P0179	P2269																
EngineMisfireDetected_TFTKO	P0300	P0301	P0302	P0303	P0304	P0305	P0306	P0307	P0308										
EngineMisfireDetected_FA	P0300	P0301	P0302	P0303	P0304	P0305	P0306	P0307	P0308										
KS_Ckt_Perf_B1B2_FA	P0324	P0325	P0326	P0327	P0328	P0330	P0332	P0333	P06B6	P06B7									

IgnitionOutputDriver_FA	P0351	P0352	P0353	P0354	P0355	P0356	P0357	P0358											
O2S_Bank_ 1_TFTKO	P0131	P0132	P0134	P2A00															
O2S_Bank_ 2_TFTKO	P0151	P0152	P0154	P2A03															
O2S_Bank_1_Sensor_1_FA	P2A00	P0131	P0132	P0133	P0134	P0135	P0053	P1133											
O2S_Bank_1_Sensor_2_FA	P013A	P013B	P013E	P013F	P2270	P2271	P0137	P0138	P0140	P0141	P0054								
O2S_Bank_2_Sensor_1_FA	P2A03	P0151	P0152	P0153	P0154	P0155	P0059	P1153											
O2S_Bank_2_Sensor_2_FA	P013C	P013D	P014A	P014B	P2272	P2273	P0157	P0158	P0160	P0161	P0060								
ECT_Sensor_Ckt_FA	P0117	P0118																	
ECT_Sensor_Ckt_TPTKO	P0117	P0118																	
ECT_Sensor_Ckt_TFTKO	P0117	P0118																	
ECT_Sensor_DefaultDetected	P0117	P0118	P0116	P0125															
ECT_Sensor_FA	P0117	P0118	P0116	P0125	P0128														
ECT_Sensor_TFTKO	P0117	P0118	P0116	P0125															
ECT_Sensor_Perf_FA	P0116																		
ECT_Sensor_Ckt_FP	P0117	P0118																	
ECT_Sensor_Ckt_High_FP	P0118																		
ECT_Sensor_Ckt_Low_FP	P0117																		
AAP_SnsrFA_NA	P2227	P2228	P2229	P2230															
AAP_SnsrFA_TC	P0237	P0238																	
AAP_SnsrCktFP_NA	P2228	P2229																	
AAP_SnsrCktFP_TC	P0237	P0238																	
AAP_SnsrTFTKO_NA	P2227	P2228	P2229	P2230															
AAP_SnsrTFTKO_TC	P0237	P0238																	
AAP2_SnsrFA	P2227	P2228	P2229	P2230															
AAP2_SnsrCktFP	P2228	P2229																	
AAP2_SnsrTFTKO	P2227	P2228	P2229	P2230															
TC_BoostPresSnsrCktFA	P0237	P0238																	
TC_BoostPresSnsrFA	P0236	P0237	P0238																
AmbPresSnsrCktFA	P2228	P2229																	
AmbPresSnsrCktFP	P2228	P2229																	
AmbientAirDefault_Snsr	P2227	P2228	P2229	P2230															
AmbientAirDefault_NoSnsr	P0101	P0102	P0103	P0106	P0107	P0108	P0111	P0112	P0113	P0114	P0121	P0122	P0123	P012B	P012C	P012D	P0222	P0223	P1221
AmbPresDfltdStatus_Snsr	P2227	P2228	P2229	P2230															
AmbPresDfltdStatus_NoSnsr	P0101	P0102	P0103	P0106	P0107	P0108	P0111	P0112	P0113	P0114	P0121	P0122	P0123	P012B	P012C	P012D	P0222	P0223	P1221
IAT_SensorCircuitTFTKO	P0112	P0113																	
IAT_SensorCircuitFA	P0112	P0113																	
IAT_SensorCircuitFP	P0112	P0113																	
IAT_SensorTFTKO	P0111	P0112	P0113																
IAT_SensorFA	P0111	P0112	P0113																
IAT2_SensorCktTFTKO	P0097	P0098																	
IAT2_SensorCktTFTKO_NoSnsr	P0112	P0113																	
IAT2_SensorCircuitFA	P0097	P0098																	
IAT2_SensorCircuitFA_NoSnsr	P0112	P0113																	
IAT2_SensorcircuitFP	P0097	P0098																	
IAT2_SensorcircuitFP_NoSnsr	P0112	P0113																	
IAT2_SensorTFTKO	P0096	P0097	P0098																
IAT2_SensorTFTKO_NoSnsr	P0111	P0112	P0113																
IAT2_SensorFA	P0096	P0097	P0098																

IAT2_SensorFA_NoSnsr	P0111	P0112	P0113																
ThrotTempSensorTFTKO	P0096	P0097	P0098																
ThrotTempSensorTFTKO_NoSnsr	P0111	P0112	P0113																
ThrotTempSensorFA	P0096	P0097	P0098																
ThrotTempSensorFA_NoSnsr	P0111	P0112	P0113																
SuperchargerBypassValveFA	P2261																		
CylDeacSystemTFTKO	P3400																		
MAF_SensorPerfFA	P0101																		
MAF_SensorPerfTFTKO	P0101																		
MAP_SensorPerfFA	P0106																		
MAP_SensorPerfTFTKO	P0106																		
SCIAP_SensorPerfFA	P012B																		
SCIAP_SensorPerfTFTKO	P012B																		
ThrottlePositionSnsrPerfFA	P0121																		
ThrottlePositionSnsrPerfTFTKO	P0121																		
TIAP_SensorPerfFA	P0236																		
MAF_SensorFA	P0101	P0102	P0103																
MAF_SensorTFTKO	P0101	P0102	P0103																
MAF_SensorFP	P0102	P0103																	
MAF_SensorCircuitFA	P0102	P0103																	
MAF_SensorCircuitTFTKO	P0102	P0103																	
MAP_SensorTFTKO	P0106	P0107	P0108																
MAP_SensorFA	P0106	P0107	P0108																
MAP_SensorCircuitFP	P0107	P0108																	
SCIAP_SensorFA	P012B	P012C	P012D																
SCIAP_SensorTFTKO	P012B	P012C	P012D																
SCIAP_SensorCircuitFP	P012C	P012D																	
AfterThrottlePressureFA_NA	P0106	P0107	P0108																
AfterThrottlePressureFA_SC	P012B	P012C	P012D																
AfterThrottleVacuumTFTKO_NA	P0106	P0107	P0108																
AfterThrottleVacuumTFTKO_SC	P012B	P012C	P012D																
SCIAP_SensorCircuitFA	P012C	P012D																	
AfterThrottlePressTFTKO_NA	P0106	P0107	P0108																
AfterThrottlePressTFTKO_SC	P012B	P012C	P012D																
MAP_SensorCircuitFA	P0107	P0108																	
MAP_EngineVacuumStatus	MAP_SensorFA OR P0107, P0108 Pending																		
CrankCamCorrelationTFTKO	P0016	P0017	P0018	P0019															
CrankSensorFA	P0335	P0336																	
CrankSensorTFTKO	P0335	P0336																	
CamSensorFA	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
CamSensorTFTKO	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
CrankIntakeCamCorrelationFA	P0016	P0018																	
CrankExhaustCamCorrelationFA	P0017	P0019																	
IntakeCamSensorTFTKO	P0016	P0018	P0340	P0341	P0345	P0346													
IntakeCamSensorFA	P0016	P0018	P0340	P0341	P0345	P0346													
ExhaustCamSensorTFTKO	P0017	P0019	P0365	P0366	P0390	P0391													
ExhaustCamSensorFA	P0017	P0019	P0365	P0366	P0390	P0391													
IntakeCamSensor_FA	P0016	P0018	P0340	P0341	P0345	P0346													

IntakeCamSensor_TFTKO	P0016	P0018	P0340	P0341	P0345	P0346													
ExhaustCamSensor_FA	P0017	P0019	P0365	P0366	P0390	P0391													
ExhaustCamSensor_TFTKO	P0017	P0019	P0365	P0366	P0390	P0391													
CrankIntakeCamCorrFA	P0016	P0018																	
CrankExhaustCamCorrFA	P0017	P0019																	
CrankSensorFaultActive	P0335	P0336																	
CrankSensor_FA	P0335	P0336																	
CrankSensorTestFailedTKO	P0335	P0336																	
CrankSensor_TFTKO	P0335	P0336																	
CamSensor_FA	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
CamSensorAnyLocationFA	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
CamSensor_TFTKO	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
EngModeNotRunTmErr	P2610																		
AnyCamPhaser_FA	P0010	P0011	P0013	P0014	P0020	P0021	P0023	P0024											
AnyCamPhaser_TFTKO	P0010	P0011	P0013	P0014	P0020	P0021	P0023	P0024											
IntkCamPhaser_FA	P0010	P0011	P0020	P0021															
EGRValvePerformance_FA	P0401	P042E																	
EGRValveCircuit_FA	P0403	P0404	P0405	P0406															
EGRValve_FP	P0405	P0406	P042E																
EGRValveCircuit_TFTKO	P0403	P0404	P0405	P0406															
EGRValvePerformance_TFTKO	P0401	P042E																	
	no codes?																		
A/C_FailedOn	P0645																		
EngOilTempSensorCircuitFA	P0197	P0198																	
EngOilModeledTempValid	GetECTR_b_ECT_SnsrFA or GetEITR_b_IAT_SnsrCktFA																		
EngOilPressureSensorCktFA	P0522	P0523																	
EngOilPressureSensorFA	P0521	P0522	P0523																
CylnderDeacDriverTFTKO	P3401	P3409	P3417	P3425	P3433	P3441	P3449												
BrakeBoosterSensorFA	P0556	P0557	P0558																
BrakeBoosterVacuumValid	P0556	P0557	P0558																
BrakeBoosterVacuumValid	GetVSPR_b_VehicleSpeedError or GetMAPR_b_MAP_SnsrFA																		
EngineTorqueEstInaccurate	GetMSF	GetFULF	GetFULF	GetFADI	GetFADI	GetMAF	GetMAP	GetEGRR_b_EGR_ValvePerf_FA											
EOPCircuit_FA	P0522	P0523																	
FuelInjectorCircuit_FA	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											
FuelInjectorCircuit_TFTKO	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											
FHPR_b_PumpCkt_FA	P0090	P0091	P0092	P00C8	P00C9	P00CA													
FHPR_b_PumpCkt_TFTKO	P0090	P0091	P0092	P00C8	P00C9	P00CA													
FHPR_b_FRP_SnsrCkt_FA	P0192	P0193																	
FHPR_b_FRP_SnsrCkt_TFTKO	P0192	P0193																	
EngineMetalOvertempActive	P1258																		
ControllerProcessorPerf_FA	P0606																		
ControllerRAM_Error_FA	P0604																		
5VoltReferenceA_FA	P0641																		
5VoltReferenceB_FA	P0651																		
IAC_SystemRPM_FA	P0506	P0507																	
TCM_EngSpdReqCkt	P150C																		
GetAPSR_PPS_1_OOR_Flt_Composite()	P2122	P2123																	
GetAPSR_PPS_2_OOR_Flt_Composite()	P2127	P2128																	
GetAPSR_b_PPS_1_OOR_Flt_Cmposite()	P2122	P2123																	
GetAPSR_b_PPS_2_OOR_Flt_Cmposite()	P2127	P2128																	
GetAPSR_b_PPS_1_OutofRangeFlt()	P2122	P2123																	
GetAPSR_b_PPS_2_OutofRangeFlt()	P2127	P2128																	
GetAPSR_PPS_1_OutofRangeFlt()	P2122	P2123																	
GetAPSR_PPS_2_OutofRangeFlt()	P2127	P2128																	
GetTPSR_b_TPS1_OOR_FltComposite()	P0122	P0123																	
GetTPSR_b_TPS2_OOR_FltComposite()	P0222	P0223																	
GetTPSR_b_FaultActive_TPS()	P0122	P0123	P0222	P0223	P2135														
GetTPSR_b_TFTKO_TPS()	P0122	P0123	P0222	P0223	P2135														
GetTPSR_b_PerfFaultActive_TPS()	P0068	P0121	P1104	P2100	P2101	P2102	P2103												
GetTPSR_b_PerfTFTKO_TPS()	P0068	P0121	P1104	P2100	P2101	P2102	P2103												
GetTPSR_ThrotAuthDefault()	P0068	P0122	P0123	P0222	P0223	P16F3	P1104	P2100	P2101	P2102	P2103	P2135							
GetSRAR_b_EnginePowerLimited()	P0068	P0122	P0123	P0222	P0223	P0606	P16F3	P1104	P2100	P2101	P2102	P2103	P2135	P2138	P2122	P2123	P2127	P2128	
	P160E	P160D	P0191	P0192	P0193	P00C8	P00C9	P00CA	P0090	P0091	P0092	P228C	P228D						

TransOutputSpeedSensor_Error																			
Long Name	**Short Name**																		
Bank	B																		
Brake	Brk																		
Circuit	Ckt																		
Engine	Eng																		
Fault Active	FA																		
Intake	Intk																		
Naturally Aspirated	NA																		
Performance	Perf																		
Position	Pstn																		
Pressure	Press																		
Sensor	Snsr																		
Supercharged	SC																		
System	Sys																		
Test Failed This Key On	TFTKO																		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Left Front Wheel Speed Sensor Circuit	C0035 C0006	Sensor signal current out of range. Note : Failure limp is ABS/TCS and AYC are all disabled.	Sensor Signal Current Sensor Signal Current	< 4.5 mA ± 10% OR > 20 mA ± 10%	Supply Voltage level Supply Voltage level	< 18V > 10V	14 consecutive loops (140 ms)	Special Type C No MIL
Left Front Wheel Speed Sensor Circuit Range/ Performance	C0035 C0018 C005A C000F	wheel speed sensor signal changes erratically. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed acceleration	> 980.66m/s/s disable condition(s):	Vehicle speed	> 13mph C0035:0F	17 consecutive loops (170 ms)	Special Type C No MIL
		A failure at the fastest and the second-fastest wheel will be detected if the ratios of the corresponding wheels indicate a deviation bigger than the actual threshold value and smaller than value defined in the threshold. A failure at the slowest and the second-slowest wheel will be detected if the ratios of the corresponding wheels indicate a deviation smaller than the actual threshold value. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation Wheel speed signal deviation	> 25% < 150% disable condition(s):	Vehicle speed	> 13mph C0035:5A	Depends on driving condition 10s - 30s	
		Periodic drop of a wheel speed signal. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal	No pulses disable condition(s):	Vehicle speed	> 13mph C0035:5A	15 consecutive wheel rotations	
		wheel speed sensor signal is missing or wheel speed sensor signal continuously indicates wheel speed too low. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation	> 40% disable condition(s):	Wheel Acceleration Vehicle speed No MIL Illuminated	> 3.13m/s/s > 9 mph C0035:18	Depends on driving condition 10s - 120s	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Right Front Wheel Speed Sensor Circuit	C0040 C0006	Sensor signal current out of range. Note : Failure limp is ABS/TCS and AYC are all disabled.	Sensor Signal Current Sensor Signal Current	< 4.5 mA ± 10% OR > 20 mA ± 10%	Supply Voltage level Supply Voltage level	< 18V > 10V	14 consecutive loops (140 ms)	Special Type C No MIL
Right Front Wheel Speed Sensor Circuit Range/ Performance	C0040 C0018 C005A C000F	wheel speed sensor signal changes erratically. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed acceleration	> 980.66m/s/s disable condition(s):	Vehicle speed	> 13mph C0040:0F	17 consecutive loops (170 ms)	Special Type C No MIL
		A failure at the fastest and the second-fastest wheel will be detected if the ratios of the corresponding wheels indicate a deviation bigger than the actual threshold value and smaller than value defined in the threshold. A failure at the slowest and the second-slowest wheel will be detected if the ratios of the corresponding wheels indicate a deviation smaller than the actual threshold value. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation Wheel speed signal deviation	> 25% < 150% disable condition(s):	Vehicle speed	> 13mph C0040:5A	Depends on driving condition 10s - 30s	
		Periodic drop of a wheel speed signal. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal	Np pulse disable condition(s):	Vehicle speed	> 13mph C0040:5A	15 consecutive wheel rotations	
		wheel speed sensor signal is missing or wheel speed sensor signal continuously indicates wheel speed too low. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation	> 40% disable condition(s):	Wheel Acceleration Vehicle Speed No MIL Illuminated	> 3.13m/s/s > 9 mph C0040:18	Depends on driving condition 10s - 120s	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Left Rear Wheel Speed Sensor Circuit	C0045 C0006	Sensor signal current out of range. Note : Failure limp is ABS/TCS and AYC are all disabled.	Sensor Signal Current Sensor Signal Current	< 4.5 mA ± 10% OR > 20 mA ± 10%	Supply Voltage level Supply Voltage level	< 18V > 10V	14 consecutive loops (140 ms)	Special Type C No MIL
Left Rear Wheel Speed Sensor Circuit Range/ Performance	C0045 C0018 C005A C000F	wheel speed sensor signal changes erratically. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed acceleration	> 980.66m/s/s disable condition(s):	Vehicle speed	> 13mph C0045:0F	17 consecutive loops (170 ms)	Special Type C No MIL
		A failure at the fastest and the second-fastest wheel will be detected if the ratios of the corresponding wheels indicate a deviation bigger than the actual threshold value and smaller than value defined in the threshold. A failure at the slowest and the second-slowest wheel will be detected if the ratios of the corresponding wheels indicate a deviation smaller than the actual threshold value. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation Wheel speed signal deviation	> 25% < 150% disable condition(s):	Vehicle speed	> 13mph C0045:5A	Depends on driving condition 10s - 30s	
		Periodic drop of a wheel speed signal. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal	No pulses disable condition(s):	Vehicle speed	> 13mph C0045:5A	15 consecutive wheel rotations	
		wheel speed sensor signal is missing or wheel speed sensor signal continuously indicates wheel speed too low. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation	> 40% disable condition(s):	Wheel Acceleration Vehicle speed No MIL Illuminated	> 3.13m/s/s > 9 mph C0045:18	Depends on driving condition 10s - 120s	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Right Rear Wheel Speed Sensor Circuit	C0050 C0006	Sensor signal current out of range. Note : Failure limp is ABS/TCS and AYC are all disabled.	Sensor Signal Current Sensor Signal Current	< 4.5 mA ± 10% OR > 20 mA ± 10%	Supply Voltage level Supply Voltage level	< 18V > 10V	14 consecutive loops (140 ms)	Special Type C No MIL
Right Rear Wheel Speed Sensor Circuit Range/ Performance	C0050 C0018 C005A C000F	wheel speed sensor signal changes erratically. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed acceleration	> 980.66m/s/s disable condition(s):	Vehicle speed	> 13mph C0050:0F	17 consecutive loops (170 ms)	Special Type C No MIL
		A failure at the fastest and the second-fastest wheel will be detected if the ratios of the corresponding wheels indicate a deviation bigger than the actual threshold value and smaller than value defined in the threshold. A failure at the slowest and the second-slowest wheel will be detected if the ratios of the corresponding wheels indicate a deviation smaller than the actual threshold value. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation Wheel speed signal deviation	> 25% < 150% disable condition(s):	Vehicle speed	> 13mph C0050:5A	Depends on driving condition 10s - 30s	
		Periodic drop of a wheel speed signal. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal	No pulses disable condition(s):	Vehicle speed	> 13mph C0050:5A	15 consecutive wheel rotations	
		wheel speed sensor signal is missing or wheel speed sensor signal continuously indicates wheel speed too low. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation	> 40% disable condition(s):	Wheel Acceleration Vehicle speed No MIL Illuminated	> 3.13m/s/s > 9mph C0050:18	Depends on driving condition 10s - 120s	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
RAM Fault	C056D C0500	RAM data corrupt. The word from the RAM cells is read and buffered. This value is inverted and written back in RAM. This inverted value is read back and inverted again and then compared with the original value stored in the Buffer. The failure is set if the double inverted word does not match the original one. Only monitored once at startup/reset Note : Fail limp mode is EBD/ABS/TCS and AYC are all disabled	Read RAM	≠ Value written in RAM	NA		Used RAM in bytes * 10ms Note : Only at start up	Special Type C No MIL
ROM Fault	C056D C0500	a) A failure is detected if the calculated ROM code parity and the parity value stored in the parity memory do not match. Note: Fail limp mode is: EBD/ABS/TCS and AYC are all disabled	Calculated ROM parity	≠ Stored parity in memory	NA	always enabled	1 loop (10 ms)	Special Type C No MIL
		b) The Mcu stores an intentional error in the parity within the parity memory cell. The failure is set if the parity compare unit does not catch this intentional error. Note: Fail limp mode is: EBD/ABS/TCS and AYC are all disabled	Calculated ROM parity	≠ Stored parity in memory	NA	always enabled	1 loop (10 ms)	
EEPROM Fault	C056D C0500	Several 32 bit CRC checksum values for the ROM regions are calculated during the code generation and stored in the ROM area.Cyclic, these 32 bits CRC checksums are calculated by a special hardware circuit and checked against the stored values by the MCU. A failure is detected if the checksums differ. This check is done for multiple cells. Note : Fail limp mode is: EBD/ABS/TCS and AYC are all disabled	Calculated checksum	# Stored checksum	NA	always enabled	10 ms	Special Type C No MIL

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
PCU Watchdog Failure		a) The Mcu calculates a watchdog word every loop and sends it to the PCU.The PCU verifies content and timing for this.The failure is detected by PCU if this word is incorrect	Calculated watchdog word	≠ sent watchdog word	NA	always enabled	one loop (10 ms)	
		b) The watchdog monitoring function within the PCU is checked once after power on. The Mcu generates intentional errors in the watchdog word and timing. A failure is set if the PCU fails to recognize this intentional error. EBD/ABS/TCS and AYC are all disable	Calculated watchdog word	≠ sent watchdog word	NA	always enabled	one loop (10 ms)	
Loop Time Failure	C056D C0500	Runtime of controller loop is too long. Note: Failure limp mode is : EBD/ABS/TCS and AYC are all disabled	Program runtime /execution time	> 10 ms	NA	always enabled	10 ms	Special Type C No MIL
Module Undervoltage	C0803	Module supply voltage low	Supply voltage to the module in V	a) First level : 9.7V +/- 0.3V b) Second level : 8.0V +/- 0.45V	Vehicle Speed Engine cranking information Engine rpm	> 10 kph is True >360 rpm	350 ms - 5000 ms	Special Type C No MIL
Module Overvoltage	C0807	Module supply voltage high	Supply voltage to the module in V	18.0 v +/- 1.0V	NA	always enabled	10ms	Special Type C No MIL

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel Rail Pressure (FRP) Sensor Performance (Rationality)	P018B	This DTC detects if the fuel pressure sensor is stuck within the normal operating range	Absolute value of change in fuel pressure as sensed during intrusive test.	<= 30 kPa			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 pass	DTC Type A 1 trip
					1. FRP Circuit Low DTC (P018C)	not active		
					2. FRP Circuit High DTC (P018D)	not active		
					3. FuelPump Circuit Low DTC (P0231)	not active	Duration of intrusive test is fueling related (5 to 12 seconds).	
					4. FuelPump Circuit High DTC (P0232)	not active		
					5. FuelPump Circuit Open DTC (P023F)	not active	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)	
					6. Reference Voltage DTC (P0641)	not active		
					7. Reference Voltage DTC (P06A6)	not active		
					8. Fuel Pump Control Module Driver Over-temperature DTC's (P064A, P1255)	not active		
					9. Control Module Internal Performance DTC (P0606)	not active		
					10. Engine run time	>=5 seconds		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					11. Emissions fuel level (PPEI $3FB) 12. Fuel pump control 13. Fuel pump control state 14. Engine fuel flow 15. ECM fuel control system failure (PPEI $1ED)	not low enabled normal or FRP Rationality control > 0.047 g/s failure has not occurred		
Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage	P018C	This DTC detects if the fuel pressure sensor circuit is shorted to low	FRP sensor voltage	< 0.14 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
Fuel Rail Pressure (FRP) Sensor Circuit High Voltage	P018D	This DTC detects if the fuel pressure sensor circuit is shorted to high	FRP sensor voltage	> 4.86 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
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 HS Comm OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank 3 test failures in 15 test samples if Fuel Pump Current >=100A enabled 1 sample/12.5 ms enabled 9V < voltage < 18V	72 test failures in 80 test samples if Fuel Pump Current <100A	DTC Type A
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 A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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 OR HS Comm OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank enabled enabled 9V < voltage < 18V	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A
Fuel System Control Module Enable Control Circuit	P025A	This DTC detects if there is a fault in the fuel pump control enable circuit	PPEI (PPEI (Powertrain Platform Electrical Interface) Fuel System Request ($1ED)	≠ Fuel Pump Control Module Enable Control Circuit	Ignition AND PPEI Fuel System Request ($1ED)	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 OR HS Comm OR Fuel Pump Control	Run or Crank enabled 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 FSCM needs to be programmed	This DTC is set via calibration, when KeMEMD_b_NoStartCal	TRUE	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled 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	Run or Crank	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 ILLUM.
					OR HS Comm OR Fuel Pump Control	 enabled enabled		
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 OR HS Comm OR Fuel Pump Control	 Run or Crank enabled 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	This DTC indicates the FSCM has detected an internal processor fault or external watchdog fault (PID 2032 can tell what causes the fault.)	1. For all I/O configuration register faults: •Register contents 2. For Processor Clock Fault: •EE latch flag in EEPROM. OR • RAM latch flag. 3. For External Watchdog Fault: • Software control of fuel pump driver	 Incorrect value. 0x5A5A 0x5A Control Lost	 Ignition OR HS Comm OR Fuel Pump Control 1. For all I/O configuration register faults: •KeMEMD_b_ProcFltCfgRegEnbl 2. For Processor Clock Fault: •KeMEMD_b_ProcFltCLKDiagEnbl 3. For External Watchdog Fault: •KeFRPD_b_FPExtWDogDiagEnbl 3. For External Watchdog Fault: •Control Module ROM(P0601)	 Run or Crank enabled enabled TRUE TRUE TRUE not active	Tests 1 and 2 1 failure Frequency: Continuously (12.5ms) Test 3 3 failures out of 15 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 ILLUM.
					3. For External Watchdog Fault: •Control Module RAM(P0604)	not active		
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 OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	1 test failure Once on controller power-up	DTC Type A 1 trip
5 Volt Reference Circuit (Short High/Low)	P0641	Detects a continuous short on the #1 5V sensor reference circuit	Reference voltage AND Output OR Reference voltage AND Output OR Reference voltage AND Output	>= 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
Fuel Pump Control Module - Driver Over-temperature 1	P064A	This DTC detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions (Tier 1 supplier Continetal responsibility)	Module Range of Operation **AND** Fuel pump driver Temp	1. Module is within Acceptable Operation Range (Motorola's responsibility - FSCM is in normal operating range for module voltage versus PWM duty cycle. Linear range from 100% @ 12.5V to 70% @ 18V.) > 190C	Ignition OR HS Comm OR Fuel Pump Control KeFRPD_b_FPOverTempDiagEnbl Ignition Run/Crank	Run or Crank enabled enabled TRUE 9V<voltage<18V	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
5 Volt Reference Circuit (Out of Range)	P06A6	Detects that the #1 5 V sensor reference circuit is out of range	Reference voltage	> 102.5% nominal (i.e. 5.125V) OR < 97.5% nominal (i.e. 4.875V)	Ignition	Run or Crank	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 ILLUM.
Fuel Pump Control Module - Driver Over-temperature 2	P1255	This DTC detects if an internal fuel pump driver overtemperature condition exists under extreme operating conditions (GM's responsibility)	Module Range of Operation **AND** Fuel pump driver Temp	Outside normal range (FSCM is NOT in normal operating range for module voltage versus PWM duty cycle. Linear range from 100% @ 12.5V to 70% @ 18V.) > 190C	Ignition OR HS Comm OR Fuel Pump Control KeFRPD_b_FPOverTempDiagEnbl Ignition Run/Crank	Run or Crank enabled enabled TRUE 9V<voltage<18V	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
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
Fuel Pump Flow Performance	P2635	This DTC detects degradation in the performance of the SIDI electronic return-less fuel system	Filtered fuel rail pressure error	<= Low Threshold (function of desired fuel rail pressure and fuel flow rate. 15% of resultant Target Pressure in the range of -28.4 to -193.5 kPa.) . **OR** <= High Threshold (function of desired fuel rail pressure and fuel flow rate. 15% of resultant Target Pressure in the range of +19.5 to +166.5 kPa.) .	1. FRP Circuit Low DTC (P018C) 2. FRP Circuit High DTC (P018D) 3. Fuel Rail Pressure Sensor Performance DTC (P018B) 4. FuelPump Circuit Low DTC (P0231) 5. FuelPump Circuit High DTC (P0232) 6. FuelPump Circuit Open DTC (P023F) 7. Reference Voltage DTC (P0641) 8. Reference Voltage DTC (P06A6)	not active not active . . . not active not active not active not active not active not active	Filtered fuel rail pressure error Time Constant = 12.5 seconds Frequency: Continuous 12.5 ms loop	DTC Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					9. Fuel Pump Control Module Driver Over-temperature DTC's (P064A, P1255)	not active		
					10. Control Module Internal Performance DTC (P0606)	not active		
					11. An ECM fuel control system failure (PPEI $1ED)	has not occurred		
					12. The Barometric pressure (PPEI $4C1) signal	valid (for absolute fuel pressure sensor)		
					13. Engine run time	>= 30 seconds		
					14. Emissions fuel level (PPEI $3FB)	not low		
					15. Fuel pump control	enabled		
					16. Fuel pump control state	normal		
					17. Battery Voltage	11V<=voltage=<18V		
					18. Fuel flow rate	> 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)		
					19. 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	1. 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	Run/Crank	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips
					2. Ignition Run/Crank Voltage	(11 – 18 V)		
					3. U0073	not active		