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_CamPosErrorLimIc1 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	System Voltage > 11 Volts, and System Voltage < 32 Volts Both Desired & Measured cam positions cannot be < KtPHSD_phi_CamPosErrorLimIc1 or > than (25.0 - KtPHSD_phi_CamPosErrorLimIc1). Desired cam position cannot vary more than 3.0 Cam Deg for at least KtPHSD_t_StablePositionTimeIc1 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_CamPosErrorLimEc 1 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	System Voltage > 11 Volts, and System Voltage < 32 Volts Both Desired & Measured cam positions cannot be < KtPHSD_phi_CamPos ErrorLimEc1 or > than (Exh25.0 - KtPHSD_phi_CamPos ErrorLimEc1). Desired cam position cannot vary more than 3.0 Cam Deg for at least KtPHSD_t_StablePositi onTimeEc1 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:	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.
					Time since last execution of 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 Learn occurs when engine run time is less than the sum of the two following calibrations: Engine Run time Additional Engine Run time delay	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 ºC > 28800 seconds -30.0 ºC ≤ Coolant ≤ 45.0 ºC < 32.0 volts < 0.200 seconds < 0.000 seconds	Once per valid cold start	2 trips Type B
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 < 4.0 ohms -OR- Calculated Heater Resistance > 10.7 ohms	No Active DTC's Coolant – IAT Engine Soak Time Coolant Temp Ignition Voltage Learn occurs when engine run time is less than the sum of the two following calibrations: Engine Run time Additional Engine Run time delay	ECT_Sensor_FA P2610 IAT_SensorFA < 8.0 ºC > 28800 seconds -30.0 ºC ≤ Coolant ≤ 45.0 ºC < 32.0 volts < 0.200 seconds < 0.100 seconds	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.
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 > 6.41 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 Continuous in MAIN processor	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 battery 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				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Internal Control Module SIDI High Pressure Pump min/max authority	P0089	This DTC 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 °	Battery Voltage Low Pressure Pump Engine Run Time Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and 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	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
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 Battery 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 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 Battery 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 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 Battery 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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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 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 Battery 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 Battery 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.
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 Battery 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	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) No Active DTCs:	>= 575 RPM <= 6600 RPM >= -7 Deg C <= 125 Deg C >= -20 Deg C <= 125 Deg C >= 0.00 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". MAP_SensorCircuitFA EGRValve_FP	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.
						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 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
Manifold Absolute Pressure Sensor Performance	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)	>= 575 RPM <= 6600 RPM >= -7 Deg C <= 125 Deg C >= -20 Deg C <= 125 Deg C >= 0.00 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	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.
						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		
			<u>Engine Not Rotating Case:</u> Manifold Pressure OR Manifold Pressure	 < 50.0 kPa > 115.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	 > 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 (0.2 Volts = 3.5 kPa)	Continuous		320 failures out of 400 samples 1 sample 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.
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 (4.5 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
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).	See "P0116: Fail if power up ECT exceeds IAT by these values" in the Supporting tables section	No Active DTC's Non-volatile memory initization Test complete this trip Test aborted this trip	VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA IgnitionOffTimeValid TimeSinceEngineRunni = Not occurred = 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.
			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. 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	IAT LowFuelCondition Diag **Block Heater detection is enabled when either of the following occurs:** 1) ECT at power up > IAT at power up by 2) Cranking time **Block Heater is detected and diagnostic is aborted when 1)or 2) occurs. 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	= False ≥ -7 ºC = False > 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	Engine run time 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)	>= 575 RPM <= 6600 RPM > -7 Deg C < 125 Deg C > -20 Deg C < 125 Deg C >= 0.00 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	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.
					No Active DTCs:	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		
TPS1 Circuit Low	P0122	Detects a continuous or intermittent short or open in TPS1 circuit	TPS1 Voltage <	0.325		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 5V reference circuit No P06A3	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		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 5V reference circuit No P06A3	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	P0128	This DTC detects if the engine coolant temperature rises too slowly due to an ECT or Cooling system fault		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	30 failures to set DTC	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Temperature			Actual accumulated airflow is > predicted accumulated airflow before:			TPS_Performance_FA TPS_FA TPS_ThrottleAuthority Defaulted IAT_SensorFA ECT_Sensor_Ckt_FA ECT_Sensor_Perf_FA VehicleSpeedSensor_FA	1 sec/sample Once per ignition key cycle	
			Range #1 (Primary) ECT reaches 71.0 °C when IAT min is < 52.0°C and ≥ 10.0°C.					
			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 acculmulated is multiplyed by 4) With Decel Fuel Cut Off active, acculmulated airflow is reduced by multiplying actual airflow by	 30.0 gps < 6.0 gps 50.00%		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					5) With Hybrid Engine Off Active accumulated Airflow is reduced by	1.00 times 1.00 grams each second		
					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 AIR intrusive test Fuel intrusive test Idle intrusive test EGR intrusive test System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control	= Not active = Not active = Not active = Not active 10.0 volts < system voltage< 32.0 volts = Not active = Not active = Not active = Not active	380 failures out of 475 samples Frequency: Continuous in 100 milli - second loop	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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		
					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	
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					AFM Status	= All Cylinders active		
					Heater Warm-up delay	= Complete		
					Engine Run Time	> 5 seconds		
					Engine Run Accum	> 150 seconds		
					Fuel Condition	<= 87 % Ethanol		
					No Active DTC's	MAP_SensorFA		
						EvapPurgeSolenoidCircuit_FA		
						EvapFlowDuringNonPurge_FA		
						EvapVentSolenoidCircuit_FA		
						EvapSmallLeak_FA		
						EvapEmissionSystem_FA		
						FuelTankPressureSnsrCkt_FA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						FuelInjectorCircuit_FA		
						AIR System FA		
					Low Fuel Condition Diag	= False		
					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		
O2S Slow Response Bank 1 Sensor 1	P0133	This DTC determines if the O2 sensor response time is degraded.	The average response time is caluclated 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	Sample time is 60 seconds	2 trips Type B
						MAP_SensorFA IAT_SensorFA		
						ECT_Sensor_FA AmbientAirDefault_No Snsr	Frequency: Once per trip	
						MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA	Green Sensor Delay Criteria	
						EvapVentSolenoidCircuit_FA	The diagnostic will not be enabled until the next	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsr Ckt_FA FuelInjectorCircuit_FA AIR System FA EthanolCompositionSensor_FA EngineMisfireDetected_FA	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		
					System Voltage	10.0 volts < system 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine speed Fuel Baro Air Per Cylinder Low Fuel Condition Diag Fuel Control State Closed Loop Active LTM fuel cell Transient Fuel Mass Baro Fuel Control State Fuel State Commanded Proportional Gain **All of the above met for** Time	1000 <= RPM <= 3500 < 87 % Ethanol > 70 kpa >= 200 mGrams = False = Closed Loop = TRUE = Enabled <= 100.0 mgrams = Not Defaulted not = Power Enrichment DFCO not active >= 0.0 % > 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 System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel	 TPS_ThrottleAuthority Defaulted MAF_SensorFA EthanolCompositionSensor_FA 10.0 volts < system voltage< 32.0 volts = All Cylinders active = Complete > 5 seconds > 150 seconds <= 87 % Ethanol	200 failures out of 250 samples. Frequency: Continuous 100msec loop	2 trips Type B
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 System Voltage	 ECT_Sensor_FA 10.0 volts < system voltage< 32.0 volts	8 failures out of 10 samples Frequency: 2 tests per trip	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Heater Warm-up delay	= Complete		
					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 MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA	430 failures out of 540 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		
					System Voltage	10.0 volts < system 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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	Frequency: Continuous in 100 milli - second loop	
						MAF_SensorFA		
						EthanolCompositionSensor_FA		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					AFM Status	= All Cylinders active		
					Heater Warm-up delay	= Complete		
					Engine Run Time	> 5 seconds		
					Engine Run Accum	> 150 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 Initial delay after Open Test Criteria met (cold start condition) Initial delay after Open Test Criteria met (not cold start condition) Equivalence Ratio Air Per Cylinder Fuel Control State **All of the above met for** Time	<= 87 % Ethanol > 45.0 seconds when engine soak time > 28800 seconds > 45.0 seconds when engine soak time ≤ 28800 seconds 0.9912 ≤ equiv. ratio ≤ 1.0137 50 ≤ APC ≤ 500 mgrams not = Power Enrichment > 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 > 74 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_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.
					B1S2 Failed this key cycle	P013B, P013E, P013F, P2270 or P2271		
					System Voltage	10.0 volts < system 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:	
					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))	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).			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2 Sensor Slow Response Lean to Rich Bank 1 Sensor 2	P013B	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Lean to Rich voltages range during Lean to Rich transition. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	The EWMA of the Post O2 sensor normalized integral value 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 > 11.0 units OR 2) Accumulated air flow during slow lean to rich test > 75 grams (lower threshold is 300 mvolts and upper threshold is 600 mvolts)	No Active DTC's B1S2 Failed this key cycle System Voltage Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell DTC's Passed DTC's Passed	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 < system voltage< 32.0 volts = Valid = Not Valid = Not Valid = False = enabled = P2270 (and P2272 (if applicable))	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 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	1 trips Type A EWMA

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					DTC's Passed	= P013E (and P014A (if applicable))	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	
					DTC's Passed	= P013A (and P013C (if applicable))		
					DTC's Passed	= P2271 (and P2273 (if applicable))		
					DTC's Passed	= P013F (and P014B (if applicable))		
					After above conditions are met: Fuel Enrich mode continued.			
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 > 30 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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					B1S2 Failed this key cycle System Voltage Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell DTC's Passed After above conditions are met: DFCO mode entered (wo driver initiated pedal input).	P013A, P013B, P013F, P2270 or P2271 10.0 volts < system voltage< 32.0 volts = Valid = Not Valid = Not Valid = False = enabled = P2270 and P2272 (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	
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 > 110 grams.	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_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.
						FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA		
					B1S2 Failed this key cycle	P013A, P013B, P013E, P2270 or P2271		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	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	
					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.			
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	TPS_ThrottleAuthority Defaulted	200 failures out of 250 samples.	2 trips Type B
						MAF_SensorFA EthanolCompositionSensor_FA	Frequency: Continuous	
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					AFM Status	= All Cylinders active	100msec loop	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Heater Warm-up delay Engine Run Time Engine Run Accum Fuel	= Complete > 5 seconds > 150 seconds <= 87 % Ethanol		
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 System 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 < system 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 Long Term Fuel Trim data accumulation: fuel trim diagnosed during decels? No **Long-Term Fuel Trim Cell Usage** Sometimes, certain Long-Term Fuel Trim	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 > 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.	Frequency: 100 ms Continuous Loop Development data indicates that the Fuel Adjustment System Diagnostic (FASD) is typically enabled during **70.7** % of the EPAIII drive cycle. This is also typical of real-world driving, however values will vary (higher or lower)	2 Trip(s) Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Cells are not utilized for control or diagnosis. **Please see "Supporting Tables" Tab for a list of cells utilized for diagnosis.**		based on the actual conditions present during the drive cycle.	
					Fuel Control Status			
					Closed Loop Long Term FT	Enabled Enabled **Please see "Closed Loop Enable Criteria" and "Long Term FT Enable Criteria" in Supporting Tables.**		
					Fuel Consumed	> 0.0 liters of fuel consumed after a fuel fill event ("Virtual Flex Fuel Sensor applications only)		
					EGR Flow Diag. Intrusive Test Not Active Catalyst Monitor Intrusive Test Not Active Post O2 Diag. Intrusive Test Not Active Device Control Not Active EVAP Diag. “tank pull down” Not Active			
					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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					EGRValveCircuit_FA MAP_EngineVacuumStatus AmbientAirDefault_NA O2S_Bank_1_Sensor_1_FA			
Fuel System Too Rich Bank 1	P0172	Determines if the fuel control system is in a rich condition, based on the filtered long-term fuel trim metric. There are two methods to determine a Rich fault. They are Passive and Intrusive. The Intrusive test is described below:	**Passive Test:** The filtered Non-Purge Long Term Fuel Trim metric	<= 0.760 (a Passive Test decision cannot be made when Purge is enabled)		Secondary Parameters and Enable Conditions are identical to those for P0171, with the exception that fuel level is not considered.	Frequency: 100 ms Continuous Loop Development data indicates that the Fuel Adjustment System Diagnostic (FASD) is typically enabled during **70.7** % 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.	2 Trip(s) Type B
			Intrusive Test: The filtered Purge Long Term Fuel Trim metric	<= 0.770				
			AND The filtered Non-Purge Long Term Fuel Trim metric	<= 0.760 for 2 out of 3 intrusive segments				
		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 Fuel Trim metric > 0.770, the test passes without checking the filtered Non-Purge Long Term Fuel Trim metric. Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions, and the execution frequency of other diagnostics.	Segment Def'n: Segments can last up to 35 seconds 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 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,					

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			indicating that the canister has been purged.					
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
			Idle test (Low Side Fuel Pressure - High Side Fuel Pressure)	Enabled ≤ -0.650 MPa OR ≥ 0.600 MPa	Vehicle Speed Pedal Position = 0 for Battery Voltage Low Pressure Fuel Pump Pressure Engine Run Time	<= 0.62 MPH 320 Counts (12.5ms per count) 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	Idle 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.
			High Drive Test (Relief Pressure - Measured high Pressure)	Enabled ≤ -5.00 MPa	Engine Speed Desired High Side Pressure Vehicle Speed Battery Voltage Low Pressure Fuel Pump Pressure Engine Run Time	1000 <= RPM <= 2200 7 <= MPa <= 8 >= 18.64 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 >= 160 counts (12.5ms per count)	
			Low Drive Test (Commanded high Pressure - Measured high Pressure) AND Modeled Injection Pressure	Enabled ≥ 3.000 MPa ≥ 3.00 MPa	Engine Speed Desired High Side Pressure Vehicle Speed Battery Voltage Low Pressure Fuel Pump Pressure Engine Run Time	1000 <= RPM <= 2200 7.00 <= MPa <= 8.00 >= 18.64 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: Flex Fuel Sensor Not FA			
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	Battery Voltage	11 ≤ Volts ≤ 32 Engine Running	Both Run Continuously Engine Synchronouse 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	Battery Voltage	11 ≤ Volts ≤ 32 Engine Running	Both Run Continuously Engine Synchronouse 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		Battery 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		Battery 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		Battery 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		Battery 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 > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 5V reference circuit No P06A3	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 > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 5V reference circuit No P06A3	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		Battery 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		Battery 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		Battery 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		Battery 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		Battery 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		Battery 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		Battery 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		Battery 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. 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)	(>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) ≥ 1.00% P0300 ≥ 1.00% emission >"Catalyst Damaging Misfire Percentage" Table: **Unless** ≤ 1000 rpm AND ≤ 20% load AND ≥ 180 counts on one cylinder	Engine Run Time ECT If ECT at startup ECT System 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)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Speed	450 < 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	≠ Fuel Cut	4 cycle delay	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Active Fuel Management	Transition in progress	0 cycle delay	
					Undetectable engine speed and engine load region	invalid speed load range in **decel index** tables	4 cycle delay	
					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% > 48 KPH	4 cycle delay	
					EGR Intrusive test	Active	12 cycle delay	
					Manual Trans	Clutch shift	4 cycle delay	
					Throttle Position AND Automatic transmission shift	> 200.00%	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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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 > 5 kph = 4 consecutive cyls = 2 consecutive cyls = 2 consecutive cyls		
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)	> 0.5000	Engine Speed	≥ 400 RPM	Weight Coefficient = 0.0400	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			VaKNKD_k_PerfCylKnockIntFilt					
			Filtered FFT Intensity: (for Abnormal Noise) VaKNKD_k_PerfCylAbnFiltIntnsity	< Abnormal Noise Threshold (see supporting tables)	Engine Speed	≥ 8500 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)	= 1	First Order Lag Filter with Weight Coefficient	Type: B MIL: YES Trips: 2
					Engine Speed	≥ 400 RPM and ≤ 8500 RPM		
					Engine Air Flow	≥ 40 mg/cylinder and ≤ 2000 mg/cylinder		
					ECT	≥ -40 deg's C	Weight Coefficient = 0.0100	
					IAT	≥ -40 deg's C		
				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)	> 0.3000	Engine Speed	≥ 400 RPM	Weight Coefficient =	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			VaKNKD_k_PerfKnockIntFilt				0.0100	
			Filtered FFT Intensity: (for Abnormal Noise) VaKNKD_k_PerfAbnFiltIntnsity	< Abnormal Noise Threshold (see supporting tables)	Engine Speed	≥ 2000 RPM	Weight Coefficient = 0.0025	
							Updated each engine event Max time to set = 10 seconds	
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		
			or					
			Sensor Return Signal Line	< 0.40 Volts			100 msec rate	
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		
			or					
			Sensor Return Signal Line	> 1.95 Volts			100 msec rate	
Crankshaft Position (CKP) Sensor A Circuit	P0335	Determines if a fault exists with the crank position sensor signal	<u>Engine-Cranking Crankshaft Test:</u> Time since last crankshaft position sensor pulse received	>= 4.0 seconds	<u>Engine-Cranking Crankshaft Test:</u> 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))	<u>Engine-Cranking Crankshaft Test:</u> Continuous every 100 msec	Type B 2 trips
			<u>Time-Based Crankshaft Test:</u>		<u>Time-Based Crankshaft Test:</u>		<u>Time-Based Crankshaft Test:</u>	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			No crankshaft pulses received	>= 1.0 seconds	Engine is Running Starter is not engaged		Continuous every 12.5 msec	
					No DTC Active:	5VoltReferenceB FA		
			Event-Based Crankshaft Test:		Event-Based Crankshaft Test:		Event-Based Crankshaft Test:	
			No crankshaft pulses received		Engine is Running OR Starter is engaged		2 failures out of 10 samples	
					No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA P0365 P0366	One sample per engine revolution	
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 Cam-based engine speed	>= 3.0 grams/second > 450 RPM	Continuous every 250 msec	
					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 Starter is not engaged		Continuous every 12.5 msec	
					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	>= 1.5 seconds	Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	= FALSE = FALSE = FALSE > 3.0 grams/second))	Continuous every 100 msec	
			Event-Based Crankshaft Test:		Event-Based Crankshaft Test:		Event-Based	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							Crankshaft Test:	
			Crank Pulses received in one engine revolution		Engine is Running		8 failures out of 10 samples	
				< 51	OR Starter is engaged			
			OR Crank Pulses received in one engine revolution	> 65	No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA P0365 P0366	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:		Engine Cranking Camshaft Test:		Engine Cranking Camshaft Test:	Type B 2 trips
			Time since last camshaft position sensor pulse received	>= 5.5 seconds	Starter engaged AND (cam pulses being received		Continuous every 100 msec	
			OR		OR			
			Time that starter has been engaged without a camshaft sensor pulse	>= 4.0 seconds	(DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	= FALSE = FALSE = FALSE > 3.0 grams/second))		
			Time-Based Camshaft Test:		Time-Based Camshaft Test:		Time-Based Camshaft Test:	
			Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Engine is Running Starter is not engaged No DTC Active:	5VoltReferenceA_FA	Continuous every 100 msec	
			Fast Event-Based Camshaft Test:		Fast Event-Based Camshaft Test:		Fast Event-Based Camshaft Test:	
			No camshaft pulses received during first 12 MEDRES events (There are 12 MEDRES events per engine cycle)		Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged		Continuous every MEDRES event	
					No DTC Active:	5VoltReferenceA_FA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						5VoltReferenceB_FA CrankSensor_FA		
			Slow Event-Based Camshaft Test: The number of camshaft pulses received during 100 engine cycles	= 0	Slow Event-Based Camshaft Test: Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Slow Event-Based Camshaft Test: 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	Fast Event-Based Camshaft Test: The number of camshaft pulses received during first 12 MEDRES events is less than 4 or greater than 10 (There are 12 MEDRES events per engine cycle)		Fast Event-Based Camshaft Test: Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Fast Event-Based Camshaft Test: Continuous every MEDRES event	Type B 2 trips
			Slow Event-Based Camshaft Test: The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	Slow Event-Based Camshaft Test: Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Slow Event-Based Camshaft Test: 8 failures out of 10 samples 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 Ignition 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 #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 Ignition Voltage	**> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2
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 Ignition 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 Ignition 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	 >= 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	 = FALSE = FALSE = FALSE > 3.0 grams/second))	<u>Engine Cranking 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.
			Time-Based Camshaft Test: Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Time-Based Camshaft Test: Engine is Running Starter is not engaged No DTC Active:	5VoltReferenceA_FA	Time-Based Camshaft Test: Continuous every 100 msec	
			Fast Event-Based Camshaft Test: No camshaft pulses received during first 12 MEDRES events (There are 12 MEDRES events per engine cycle)		Fast Event-Based Camshaft Test: Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Fast Event-Based Camshaft Test: Continuous every MEDRES event	
			Slow Event-Based Camshaft Test: The number of camshaft pulses received during 100 engine cycles	= 0	Slow Event-Based Camshaft Test: Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Slow Event-Based Camshaft Test: 8 failures out of 10 samples Continuous every engine cycle	
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: The number of camshaft pulses received during first 12 MEDRES events is less than 4 or greater than 10 (There are 12 MEDRES events		Fast Event-Based Camshaft Test: Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged		Fast Event-Based Camshaft Test: 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.
			per engine cycle)		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		
				< 398			Continuous every engine cycle	
			OR	> 402				
Secondary AIR Incorrect Airflow Single Bank Systems	P0411	Detects an insufficient flow condition	Predicted System Pressure versus Actual System Pressure Error		BARO	> 60 kPa	Phase 1 Conditional test weight > 7.0 seconds	
					Inlet Air Temp	> -11.0 deg C.		2 trip(s)
				> 4.5 kPa	Coolant Temp	> -11.0 deg C.		
		This test is run during Phase 1 (AIR pump commanded On, Valve commanded Open)		or < -7.5 kPa		< 60.0 deg C.		Type B
					Engine off time	> 3600.0 seconds		
			OR		System Voltage	> 10.0 OR < 32.0 Volts	Total 'String Length' accumulation time	
					SL Stability time	> 4.0 seconds		
			System Pressure Error	> 5.0 kPa	SL RPM range	rpm < 4700 or > 4900		
		Leaks downstream of the valve are detected via an evaluation of both pressure error and average pressure “String Length”(SL) – a term that represents the absolute pressure delta accumulated every 6.25ms, then averaged over the duration of the test. Low SL values are indicative of downstream leaks or blockages.	while the Average String Length	or < -1.0 kPa **>SL Threshold Bank 1** Table	**Conditional test weight is calculated by multiplying the following Factors** **Phase 1 Baro Test Weight Factor** **Phase 1 MAF Test Weight Factor** **Phase 1 System Volt Test Weight Factor** **Phase 1 Ambient Temp Test Weight Factor**		> 10 seconds	
				disable conditions:	MAP	< 20 kPa for 2 seconds		
					Engine Speed	> 5000 RPM		
					MAF	> 50 gm/s for 3 seconds	Frequency: Once per trip when AIR pump commanded On	
					No active DTCs:	AIRSystemPressureSensor FA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						AIRValveControlCircuit FA AIRPumpControlCircuit FA MAF_SensorFA AmbientAirDefault_NA IAT_SensorFA ECT_Sensor_FA EngineMisfireDetected _FA CatalystSysEfficiencyL oB1_FA CatalystSysEfficiencyL oB2_FA ControllerProcessorPer f_FA 5VoltReferenceA_FA 5VoltReferenceB_FA IgnitionOutputDriver_F A FuelInjectorCircuit_FA		
Secondary AIR Solenoid Control Circuit	P0412	This DTC checks the AIR solenoid 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 Voltage	> 10.0 Volts < 32.0 Volts	20 failures out of 25 samples 250 ms loop Continuous	2 trip(s) Type B
Secondary AIR Pump Control Circuit	P0418	This DTC checks the AIR Pump 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 Voltage	> 10.0 Volts < 32.0 Volts	20 failures out of 25 samples 250 ms loop Continuous	2 trip(s) Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Catalyst System Low Efficiency Bank 1	P0420	Oxygen Storage	Normalized Ratio OSC Value (EWMA filtered)	< 0.350	***Valid Idle Period Criteria***		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:	Type A 1 Trip(s)
		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 30 seconds since end of last idle period.		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine run time	≥ MinimumEngineRunTime, **This is a function of Coolant Temperture, 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			
					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		
					RunCrank 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.)			
					Closed loop fueling Enabled			
					PRNDL			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Idle Stable Criteria :: Must hold true from after Catalyst Idle Conditions Met to the end of test			
					MAF	*2.50 < g/s < 11.00*		
					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 > 0.580 and the current OSC Normalized Ratio value is < 0.350			
					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:			
					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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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			
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	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.	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 6 under normal conditions Run length is 3 to 6 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.
					if normalized result and EWMA is passing	≥ 17 hours		
					OR Time since last complete test	≥ 10 hours		
					if normalized result or EWMA is failing Estimated ambient temperature at end of drive	0 °C ≤ Temperature ≤ 34 °C		
					Estimate of Ambient Air Temperature Valid			
			When EWMA is , the DTC light is illuminated.	> 0.59 (EWMA Fail Threshold)	**Conditions for Estimate of Ambient Air Temperature to be valid:**			
		After the volatility check, the vent solenoid will close. After the vent is closed, typically a build up of pressure from the hot soak begins (phase-1). The pressure typically will peak and then begin to decrease as the fuel cools. When the 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.	The DTC light can be turned off if the EWMA is and stays below the EWMA fail threshold for 2 additional consecutive trips.	≤ 0.35 (EWMA Re-Pass Threshold)	**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**	≤ 8 °C ≤ 7200 seconds		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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**	≤ 7200 seconds Vehicle Speed ≥ 19.9 mph AND Mass Air Flow ≥ 6 g/sec		
					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.**	> 7200 seconds 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 then test aborts and unsuccessful attempts is incremented. OR **2. Vacuum Refueling Detected**	< -5		

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.			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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 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.		PT Relay Voltage	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples 250 ms / sample Continuous with	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							solenoid operation	
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 After setting the DTC for the first time, 2 liters of fuel must be consumed before setting the DTC for the second time.	 < -623 Pa > 1245 Pa > 2989 Pa ≥ 10 liters	Fuel Level System Voltage Startup IAT Startup ECT BARO No active DTCs:	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C ≥ 70 kPa MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorCircuitFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454	Once per Cold Start Time is dependent on driving conditions Maximum time before test abort is 1000 seconds	2 trips Type B
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 Run/Crank voltage goes to 0 volts at key off	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples 250 ms / sample Continuous with solenoid operation	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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 and stays below the EWMA fail threshold for 2 additional consecutive trips.	0.2 volts 0.2 volts > 0.73 (EWMA Fail Threshold) ≤ 0.40 (EWMA Re-Pass Threshold)	This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The number of times that it executes can range from zero to two per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.	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.
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 Stops 6.0 seconds after key-off	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 Stops 6.0 seconds after key-off	is 0.10 seconds	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. An abrupt change is defined as a change in vacuum:		This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete. The test will report a failure if 2 out of 3 samples are failures.	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			in the span of 1.0 seconds. But in 12.5 msec. A refueling event is confirmed if the fuel level has a persistent change for 30 seconds.	>112 Pa < 249 Pa of 10 %			12.5 ms / sample Continuous when vent solenoid is closed.	
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.	> 25 liters ≤ 2740 Pa ≥ 2740 Pa	Fuel Level System 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 <u>Weak Vacuum Follow-up Test</u> This test can run following a weak vacuum failure or on a hot restart.	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts ≥ 70 kPa ≥ 3.00 % MAP_SensorFA TPS_FA VehicleSpeedSensor_F 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
Fuel Level Sensor 1 Circuit Low Voltage	P0462	This DTC will detect a fuel sender stuck out of range low in the	Fuel level Sender % of 5V range	< 10 %	Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	100 failures out of 125 samples	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		primary fuel tank.			Run/Crank voltage goes to 0 volts at key off		100 ms / sample Continuous	
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 Run/Crank voltage goes to 0 volts at key off	11 volts ≤ Voltage ≤ 32 volts	100 failures out of 125 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 intermintant change in fuel level is defined as: The fuel level changes and does not remain for 30 seconds during a 600 second refueling rationality test.	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 The test will report a failure if 2 out of 3 samples are failures. 100 ms / sample	1 trips Type A
Cooling Fan 1 Relay Control Circuit (ODM)	P0480	This DTC checks the circuit for electrical integrity during	The ECM detects that the commanded state of the driver		Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	200 failures out of 250 samples	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		operation.	and the actual state of the control circuit do not match.		Engine Speed	≥ 400 RPM	25 ms / sample Continuous with fan operation	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	200 failures out of 250 samples 25 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 System 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 ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454	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.
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 No active DTCs	> 70 kPa > 60 °C ≥ 60 sec 32 ≥ volts ≥ 11 ≥ 3 sec > 3 sec > -20 °C ≤ 2 mph ≤ 25 rpm > 5 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) AmbientAirDefault ECT_Sensor_FA EngCoolHot EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA	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.
						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 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 > 5 sec PTO not active Transfer Case not in 4WD LowState	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.
					No active DTCs	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) 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						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)
					OBD Manufacturer Enable Counter: 0			
					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: <= 2200.00 RPM			
					Barometric Pressure: >= 60.00 KPa			
					Pedal position: <= 1.00 Pct			
					For the engine speeds and loads in which Dual Pulse is active:			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Dual Pulse Error induced misfires percentage	>= catalyst damaging misfire		
					Dual Pulse Error induced misfires percentage	< 90% of the maximum achieveable catalyst damaging misfire.		
					Engine Cycles	>= 50		
					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	> 2500.00 RPM		
					OR			
					Barometric Pressure	< 60.00 Kpa		
					Pedal position	> 2.00 Pct		
					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		
					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			
					AccelPedalFailure			
					ECT_Sensor_FA			
					IAT_SensorCircuitFA			
					IAT2_SensorCircuitFA			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					CrankSensorFaultActive FuelInjectorCircuit_FA MAF_SensorFA MAP_SensorFA AnyCamPhaser_TFTKO Clutch Sensor FA IAC_SystemRPM_FA IgnitionOutputDriver_FA TPS_FA VehicleSpeedSensor_FA TransmissionEngagedState_FA EngineTorqueInaccurate FuelInjectorCircuit_TFTKO FuelPumpRlyCktFA FuelInjectorCircuit_FA FRP_SnsrCkt_FA FRP_SnsrCkt_TFTKO HighPressPumpCkt_TFTKO HighPressPumpCkt_FA			
System Voltage Low	P0562	This DTC determines if the current system voltage is below the minimum required voltage for proper ECM operation.	System voltage	≤ 9 volts	Ignition is “ON” Engine Speed	 ≥ 400 RPM	5 failures out of 6 samples 1 second / sample Continuous	1 trip Type C
System Voltage High	P0563	This DTC determines if the current system voltage is above the maximum allowed voltage for proper ECM operation.	System 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		CAN cruise switch diagnostic enable in ECM	-1.0 X	fail continuously for greater than 0.500 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 Resume Circuit	P0567	Detects a failure of the cruise resume switch in a continously applied state	Cruise Control Resume switch remains applied for greater than a calibratable period of time for architecture where cruise switch states are received over serial data		CAN cruise switch diagnostic enable in ECM	TRUE -1	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 continously applied state	Cruise Control Set switch remains applied for greater than a calibratable period of time for architecture where cruise switch states are received over serial data		CAN cruise switch diagnostic enable in ECM	TRUE -1	fail continuously for greater than 90.000 seconds	Type: C MIL: NO Trips: 1
Cruise Control Input Circuit	P0575	Detects rolling count or protection value errors in Cruise Control Switch Status serial data signal	If x of y rolling count / protection value faults occur, disable cruise for duration of fault		Cruise Control Switch Serial Data Error Diagnostic Enable	TRUE -1	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	2) 254 failures detected via Error Correcting Code			2) Diagnostic runs continuously via the flash hardware	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			calibrations.					
			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				
Control Module Not Programmed	P0602	This DTC will be stored if the PCM is a service PCM that has not been programmed.	Output state invalid		PCM State	= crank or run	Diagnostic runs at powerup	Type A 1 trips
						PCM is identified through calibration as a Service PCM		
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	Type A 1 trips
							Diagnostic reports a fault if 1 failure occurs	
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 >=	254 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 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 >=	254 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)	
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 >	0.46000 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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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 recieved by the Primary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was recieved			Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions	In the primary processor, 159/399 counts intermittent or 39 counts continuous; 39 counts continuous @ initialization	
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 recieved by the Secondary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was recieved				In the secondary processor, 20/200 counts intermittent or 0 counts continuous; 0 counts continuous @ initialization	
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		KeMEMD_b_StackLimitTestEnbl == 1 Value of KeMEMD_b_StackLimitTestEnbl is: 1. (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
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 >	0.450 seconds		always running	0.450 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			KePISD_b_ALU_TestEnbld == 1 Value of KePISD_b_ALU_TestEnbld is: 1. (If 0, this test is disabled)	12.5 ms	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Secondary processor configuration register check		Verify secondary processor configuration register masks versus known good data	2 fails in a row			KePISD_b_ConfigRegTestEnbld == 1 Value of KePISD_b_ConfigRegTestEnbld is: 1. (If 0, this test is disabled)	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		KePISD_b_MainCPU_SOH_FltEnbld == 1 time from initialization >= 0.488 seconds Value of KePISD_b_ConfigRegTestEnbld is: 1. (If 0, this test is disabled)	50 ms	
MAIN detected corruption in throttle or pedal critical RAM data		Test for critical vaules 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		KePISD_b_SeedUpdKeyStorFltEnbl== 1 Value of KePISD_b_SeedUpdKeyStorFltEnbl is: 1. (If 0, this test is disabled) KePISD_b_12p5msSeqTestEnbld== 1 Value of KePISD_b_12p5msSeqTestEnbld is: 1. (If 0, this test is disabled)	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 >	360.000 seconds	Powertrain relay	> 6.41 V	30 s	
MAIN processor ALU check		Verify MAIN processor correctly performs know calculation. Verify the integrity of all general purpose registers	2 fails in a row			KePISD_b_ALU_TestEnbld == 1 Value of KePISD_b_ALU_TestEnbld is: 1. (If 0, this test is disabled)	12.5 ms	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
MAIN processor configuration register check		Verify secondary processor configuration register masks versus known good data	2 fails in a row			KePISD_b_ConfigReg TestEnbld == 1 Value of KePISD_b_ConfigReg TestEnbld is: 1. (If 0, this test is disabled)	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		KeMEMD_b_StackLimitTestEnbl == 1 Value of KeMEMD_b_StackLimitTestEnbl is: 1. (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
MAIN processor ADC test		A test Voltage of known value is read by the MAIN proocessor via an ADC channel	Voltage deviation >	9		KePISD_b_A2D_Cnvrtr TestEnbld == 1 Value of KePISD_b_A2D_Cnvrtr TestEnbld is: 1. (If 0, this test is disabled)	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 occured since last controller initialization. Counter >=	3 (results in MIL), 5(results in MIL and remedial action)		KeMEMD_b_FlashECC_CktTestEnbl == 1 Value of KeMEMD_b_FlashECC_CktTestEnbl is: 1. (If 0, this test is disabled)	variable, depends on length of time to access flash with corrupted memory	
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 occured since last controller initialization. Counter >=	3 (results in MIL), 5 (results in MIL and remedial action)		KeMEMD_b_RAM_ECC_CktTestEnbl == 1 Value of KeMEMD_b_RAM_ECC_CktTestEnbl is: 1. (If 0, this test is disabled)	variable, depends on length of time to access flash with corrupted memory	
MAIN DMA transfer check		Verify MAIN processor DMA transfer from Flask to RAM is equal	1 fail (data not equal)			KePISD_b_DMA_XferTestEnbld == 1 Value of KePISD_b_DMA_XferTestEnbld is: 0. (If 0, this test is disabled)	variable, depends on length of time to write flash to RAM	
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	8 failures out of 10 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	8 failures out of 10 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	8 failures out of 10 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	Battery 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	= unlock/accesory, run, or crank	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 programed 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 th 5 volt reference circuit #1	ECM Vref1 < or ECM Vref1 >	4.875 5.125		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
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 NO MIL
5 Volt Reference #2 Circuit	P0651	Detects a continuous or intermittent short on th 5 volt reference circuit #2	ECM Vref2 < or ECM Vref2 >	4.875 5.125		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all	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
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 Continous failures ≥ 4 seconds	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on th 5 volt reference circuit #1	ECM Vref3 <	4.875		Run/Crank voltage or Powertrain relay voltage > 6.41 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
			or ECM Vref3 >	5.125				
5 Volt Reference #4 Circuit	P06A3	Detects a continuous or intermittent short on th 5 volt reference circuit #2	ECM Vref4 <	4.875		Run/Crank voltage or Powertrain relay voltage > 6.41 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
			or ECM Vref4 >	5.125				
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)	= 1	First Order Lag Filter with Weight Coefficient	Type: B MIL: YES Trips: 2
					Engine Speed	> 400 RPM and < 3500 RPM		
					Engine Air Flow	≥ 40 mg/cylinder and ≤ 2000 mg/cylinder	Weight Coefficient = 0.0100 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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Transmission Control Module (TCM) Requested MIL Illumination	P0700	Monitors the TCM MIL request line to determine when the TCM has detected a MIL illuminating fault.	Transmission Emissions-Related DTC set			Time since power-up > 3 seconds	Continuous	Type A 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 $1C7/$1C9 for PPEI3, $1CA for Hybrid))	Message <> 2's complement of message	Serial communication to EBTCM (U0108) Power Mode	No loss of communication = Run	**All except Class2 PWM:** Count of 2's complement values not equal >= 20 Performed every 12.5 msec	
			OR		Engine Running	= True		
			Serial Communication message ($140 for PPEI2 or $1C7/$1C9 for PPEI3, $1CA for Hybrid)) rolling count value	Message rolling count value <> previous message rolling count value plus one	Status of traction in GMLAN message ($4E9)	= Traction Present	10 rolling count failures out of 10 samples Performed every 12.5 msec	
			OR					
			Too many minimum limit torque request transitions occur from TRUE to FALSE to TRUE within a time period	Requested torque intervention type toggles from not increasing request to increasing request			>= 5 multi-transitions out of 5 samples Performed every 200 msec	1 trip(s) Type C
			Torque request greater than allowed	> 250 Nm for engine based traction torque system, 4000 Nm for axle based traction torque system			>= 4 out of 10 samples Performed every 12.5 msec	
Inlet Airflow System Performance	P1101	Determines if there are multiple air induction problems affecting airflow and/or manifold pressure.	Filtered Throttle Model Error AND	<= 300 kPa*(g/s)	Engine Speed Engine Speed Coolant Temp Coolant Temp	>= 575 RPM <= 6600 RPM > -7 Deg C < 125 Deg C	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.
			(ABS(Measured Flow – Modeled Air Flow) Filtered OR ABS(Measured MAP – MAP Model 1) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	> 17 grams/sec > 25.0 kPa) > 25.0 kPa	Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) No Active DTCs:	> -20 Deg C < 125 Deg C >= 0.00 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 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						IAT_SensorFA IAT_SensorCircuitFP		
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 If Slope Time L/R or R/L Switches are below the threshold.	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 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	No Active DTC's Bank 1 Sensor 1 DTC's not active System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Diag	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 FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA EthanolCompositionSensor_FA EngineMisfireDetected_FA = P0131, P0132 or P0134 10.0 volts < system voltage< 32.0 volts = Not active = Not active = Not active = Not active = False	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. (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	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Green O2S Condition O2 Heater on for Learned Htr resistance Engine Coolant IAT Engine run Accum Time since any AFM status change Time since Purge On to Off change Time since Purge Off to On change Purge duty cycle Engine airflow Engine speed Fuel Baro Air Per Cylinder Low Fuel Condition Diag Fuel Control State Closed Loop Active LTM fuel cell Transient Fuel Mass Baro Fuel Control State Fuel State Commanded Proportional Gain **All of the above met for** Time	= Not Valid >= 40 seconds = Valid > 70 ºC > -40 ºC > 120 seconds > 2.0 seconds > 0.0 seconds > 1.5 seconds >= 0 % duty cycle 14 gps <= engine airflow <= 40 gps 1000 <= RPM <= 3500 < 87 % Ethanol > 70 kpa >= 200 mGrams = False = Closed Loop = TRUE = Enabled <= 100.0 mgrams = Not Defaulted not = Power Enrichment DFCO not active >= 0.0 % > 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		Battery 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 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		Battery 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 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		Battery 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		Battery 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 Delay Enabled/Disabled Delay time starting at Ignition-On	Enabled Disabled 31 (msec)	50 Failures out of 63 Samples	Type: A MIL: YES Trips: 1
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) > 4.66 KJ/s (low RPM failure mode)	**To enable the diagnostic, the Cold Start Emission Reduction Strategy must be Active per the following:** Catalyst Temperature **AND** Engine Coolant **The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:** Catalyst Temperature **AND** Engine Run Time **OR** Engine Run Time **OR** Engine Coolant **Other Enable Criteria** Vehicle Speed Driver must be off the accel pedal. This checks that the A change in throttle position (tip-in/tip-out) will initiate a Pedal Close Delay Timer the diagnostic will continue the calculation.	< 500.00 degC > -10.00 degC >= 1000.00 degC >= 17.50 seconds > 17.50 seconds >= 56.00 degC < 2 kph > 5.00 seconds	Runs once per trip when the cold start emission reduction strategy is active Frequency: 100ms Loop Test completes after 10 seconds of accumulated qualified data.	Type A 1 Trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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			
					TransmissionEngagedState_FA			
					EngineTorqueInaccurate			
Transmission Engine Speed Request Circuit	P150C	Determines if engine speed request from the TCM is valid	Serial Communication rolling count value	+ 1 from previous $19D message (PTEI3)	Diagnostic enable bit	1	Diagnostic runs in 25 ms loop	2 trips Type B
			Transmission engine speed protection	not equal to 2's complement of transmission engine speed request + Transmission alive rolling count	Engine run time	0.5		
					# of Protect Errors	10		
					# of Alive Rolling Errors	6		
					No idle diagnostic 506/507 code	IAC_SystemRPM_FA		
					No Serial communication loss to TCM	(U0101)		
					Engine Running	= TRUE		
					Power mode	Run Crank Active		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Steady State Actuation Fault	P1516	Detect an inablity to maintain a steady state throttle position	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 > 6.41 and reduced power is false, else the failure will be reported for all conditions	0.49 ms	Type: A MIL: YES Trips: 1
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 SIDI fuel pump Low Current Test Current	≥ 3.00 Amps ≤ 0.10 Amps	Battery Voltage Low Pressure Pump Engine Run Time Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and 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	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	Current High - 750 failures out of 938 samples Current 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.
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 Run/crank voltage > and Run/crank voltage >	Table, f(IAT). See supporting tables 5.5 5.5	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	74.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Engine min capacity above threshold	75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 108 ms continuous, 0.5 down time multipier	
			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 148 ms continuous, 0.5 down time multipier	
			Absolute difference of adjustment factor based on temperature and its dual store above threshold	2.76 m/s		Ignition in unlock/accessory, run or crank	Up/down timer 148 ms continuous, 0.5 down time multipier	
			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 265 RPM		Engine speed greater than 0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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 multipier	
			Speed Control's Preditcted 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 multipier	
			Engine oil temperature and its dual store do not equal	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 348 ms continuous, 0.5 down time multipier	
			Desired throttle position greater than redundant calculation plus threshold	7.69 percent		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of the rate limited pre-throttle pressure and its redundant calculation greater than threshold	1.88 kpa		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Throttle desired torque above desired torque plus threshold	75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Desired filtered throttle torque exceeds the threshold plus the higher of desired throttle torque or modeled throttle torque	75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque feedback proportional term is out of allowable range or its dual store copy does not match	High Threshold 37.50 Nm Low Threshold -37.50 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque feedback integral term magnitude or rate of change is out of allowable range or its dual store copy does not match	High Threshold 70.31 Nm Low Threshold -75.00 Nm Rate of change threshold		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of Final Torque feedback proportional plus integral term and its redundant calculation is out of bounds given by threshold range	High Threshold 75.00 Nm Low Threshold -75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Difference of torque desired throttle area and its redundant calculation is out of bounds given by threshold range	High Threshold 0.50% Low Threshold -0.50%		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of torque model coefficients and its redundant calculation is out of bounds given by threshold range	High Threshold 0.0001484 Low Threshold -0.0001484		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Difference of base friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 75.00Nm Low Threshold -75.00Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Accessory drive friction torque is out of bounds given by threshold range	High Threshold 75.00 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			AC friction torque is greater than commanded by AC control software or less than threshold limit.	High Threshold 40.00 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of Oil temperature delta friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 75.00 Nm Low Threshold -75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Generator friction torque is out of bounds given by threshold range	High Threshold 75.00 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Supercharger friction torque is out of bounds given by threshold range	High Threshold 75.00 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			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 75.00 Nm Low Threshold -75.00 Nm Rate of change threshold 4.69 Nm/loop		Engine speed >0rpm MAF, MAP and Baro DTCs are false	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque error compensation is out of bounds given by threshold range	High Threshold 75.00 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Delta Torque Baro compensation is out of bounds given by threshold range	High Threshold 5.09 Nm Low Threshold -2.50 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			1) Difference of reserve torque value and its redundant calculation exceed threshold 2) Reserve request does not agree with operating conditions 2) Difference of final predicted torque and its redundant calculation exeed threshold 3) Rate of change of reserve torque exceeds threshold, increasing direction only 4) Reserve engine torque above allowable capacity by the threshold	1) 74.00 Nm 2) NA 3) 74.00 Nm 4) 74.00 Nm		1&2) Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 75.00 Nm 3&4) Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference of the calculated spark offset for equivalence ratio and its redundant calculation greater than threshold	13.81 degrees		Engine speed >0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			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 multipier	
			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 148 ms continuous, 0.5 down time multipier	
			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 multipier	
			Predicted torque for zero pedal determination is greater than calc'ed limit.	Table, f(Engine, Oil Temp). See supporting tables + 75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			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 multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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 multipier	
			Difference of Weighting factor for number of cylinders fueled and its redundant calculation is above threshold	0.26		Engine run flag = TRUE > 10.00s	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Difference of minimum spark advance limit and its redundant calculation is out of bounds given by threshold range	13.81 degrees		Ignition in unlock/accessory, run or crank	Up/down timer 148 ms continuous, 0.5 down time multipier	
			Difference of commanded spark advance and adjusted delivered is out of bounds given by threshold range	13.81 degrees		Engine speed >0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			Estimated Engine Torque and its dual store are not match	75.00 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Estimated Engine Torque without reductions due to torque control and its dual store are not match	75.00 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of desired spark advance for managed torque and its redundant calculation is out of bounds given by threshold range	13.81 degrees		Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 75.00 Nm	Up/down timer 448 ms continuous, 0.5 down time multipier	
			Absolute difference of Engine Capacity Minimum Running Immediate Brake Torque Excluding Cylinder Sensitivity and its redundant calculation is out of bounds given by threshold range	75.00 Nm		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multipier	
			One step ahead calculation of air-per-cylinder and its dual store do not match	142.17 mg		Engine speed >0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	

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 > 750rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			Rate limited cruise axle torque request and its dual store do not match	138.69 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 163 ms continuous, 0.5 down time multipier	
			1) Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range 2) Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its dual store do not equal	1) 5.00 % 2) NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			3) Absolute difference of Calculated accelerator pedal position and its dual store do not equal	3) NA				
			Commanded axle torque is greater than its redundant calculation by threshold	1109.51 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded axle torque is less than its redundant calculation by threshold	-65535.00 Nm		Ignition in unlock/accessory, run or crank Redundant commanded axle torque < --65535.00 Nm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			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 multipier	
			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 multipier	

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 0.074		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Launch spark is active but the launch spark redundant path indicates it should not be active	NA		Engine speed < 7000.00 or 7200.00 rpm (hysteresis pair)	Up/down timer 148 ms continuous, 0.5 down time multipier	
			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	255/6 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 multipier	
			TOS to wheel speed conversion factor is out of bounds given by threshold range	High Threshold 1.10 T/C Range Hi 0.10 T/C Range Lo Low Threshold 1.10 T/C Range Hi 0.10 T/C Range Lo		Ignition 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 148 ms continuous, 0.5 down time multipier	
			Absolute difference of Friction torque and its redundant calculation is out of bounds given by threshold range	75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Absolute difference of Accessory torque and its redundant calculation is out of bounds given by threshold range	75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of Filtered Air-per-cylinder and its redundant calculation is out of bounds given by threshold range	142.17 mg		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference between the previous Final Advance and the current Final Advance not Adjusted for Equivalence Ratio is out of bounds given by threshold range	13.81 degrees		Engine speed >0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			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 multipier	
			Equivance Ratio torque compensation exceeds threshold	-75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference between Equivance Ratio torque compensation and its dual store out of bounds given bt threshold	75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			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 multipier	
			Zero pedal axle torque is out of bounds given by threshold range	High Threshold 1109.51 Nm Low Threshold -65535.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Torque Learn offset is out of bounds given by threshold range	High Threshold 0.00 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

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 and two step ahead is greater than threshold	80.00 mg		Engine speed >750rpm	Up/down timer 448 ms continuous, 0.5 down time multipier	
			Difference between Unmanaged Spark and PACS Spark is greater than threshold	13.81 degrees		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Predicted torque for uncorrected zero pedal determination is greater than calc'ed limit.	Table, f(Engine, Oil Temp). See supporting tables + 75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque request exceeds calculated torque limit	Table, f(Engine, Oil Temp). See supporting tables + 75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	Table, f(Engine, Oil Temp). See supporting tables + 75.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Difference between Driver Requested Immediate Torque primary path and its secondary exceeds threshold	1109.51 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Engine Speed Lores Intake Firing (event based) calculation does not equal its redundant calculation	N/A		Engine speed greater than 0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			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 148 ms continuous, 0.5 down time multipier	
			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 multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Control Module Throttle Actuator Position Performance	P2101	1) Detect a throttle positioning error	Difference between measured throttle position and modeled throttle position >	7.69 percent		Run/crank voltage or Powertrain relay voltage > 6.41 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
			Difference between modeled throttle position and measured throttle position >	7.69 percent	TPS minimum learn is not active and Throttle is being Controlled and (Engine Running or Ignition Voltage > or Ignition Voltage >) Ignition voltage failure is false (P1682)	11 5.5		MIL: YES Trips: 1
		2) Detect throttle control is driving the throttle in the incorrect direction or exceed the reduced power limit	Throttle Position >	44.76 percent	TPS minimum learn is active		2. 11counts; 12.5 msec/count in the primary processor	
			Throttle Position >	43.76 percent	Reduced Power is True Powertrain relay voltage	> 6.41 Volts		
Throttle return to default	P2119	Throttle unable to return to default throttle position after de-energizing ETC motor.	TPS1 Voltage >	1.895	Throttle de-energized	Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions	0.4969sec	Type: C
			AND		No TPs circuit faults	No 5V reference error No 5 V reference DTCs		MIL: NO
			TPS2 Voltage >	2.005	PT Relay Voltage >	5.5		Trips: 1

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 Lo	P2122	Detect a continuous or intermittent short or open in the APP sensor #1 on Main processor	APP1 Voltage <	0.463		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 5V reference circuit No P06A3	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	Run/crank voltage Powertrain relay voltage	Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 5V reference circuit No P06A3	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		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 3 5V reference circuit No P0697	1. 19/39counts or 14counts continuous; 12.5 msec/count in the 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.
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		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 3 5V reference circuit No P0697	1. 19/39counts or 14 counts continuous; 12.5 msec/count in the main processor	Type: A 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 2. Detects a continuous or intermittent correlation fault between TP sensors #1 and #2 on MHC processor	1. Difference between TPS1 displaced and TPS2 displaced > 2. Difference between (normalized min TPS1) and (normalized_min TPS2) >	7.022% offset at min. throttle position with an increasing to 10% at max. throttle position 5.000 % of Vref		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 5V reference circuit No P06A3 No TPS sensor faults	1. 79/159 counts or 58 counts continuous; 3.125 msec/count in the main processor	Type: A MIL: YES Trips: 1
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 >	5.000% offset at min. pedal position with an increasing to 10% (0.5v)at max. pedal position for Main processor.		Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions	1. 19/39 counts intermittent or 15 counts 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.
			2. Difference between the learned PPS1 min and PPS2 min >	5.000% Vref		No APP sensor faults P2122, P2123,P2127, P2128 No 5 V reference DTCs P06A3,P0697		A MIL: YES Trips: 1
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		Battery 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		Battery 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		Battery 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		Battery 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		Battery 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		Battery 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 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		Battery 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		Battery 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.
Minimum Throttle Position Not Learned	P2176	TP sensors were not in the minmum 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	0.955		Run/crank voltage or Powertrain relay voltage > 6.41 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 and post catalyst O2 sensor voltage characteristics. To improve S/N, pre-catalyst O2 voltages between 0 and 600 millivolts are ignored. This feature is enabled at Air Per Cylinder values <= 1000 mg/cylinder. Note: If the first voltage value is >= the second voltage value, AND/OR the Air Per Cylinder value is equal to zero, the feature is not used on this application and the full pre-catalyst O2 voltage range is utilized.	Bank 1 Filtered Length Ratio variable	> 0.49	System Voltage	*10 <= V <= 32 for >= 4 seconds*	Frequency: Continuous Monitoring of O2 voltage signal in 12.5ms loop The AFIM Filtered Length Ratio variable is updated after every 2.50 seconds of valid data. The first report is delayed for 90 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.	2 Trip(s) Type B
					ECT	> -20 oC		
					Engine speed	*500 <= rpm <= 4300*		
			OR		Mass Airflow	*7.0 <= g/s <= 510.0*		
			Bank 1 AFM (DoD) Filtered Length Ratio variable (AFM applications only)	> 0.01	Air Per Cylinder	*0 <= mg/cylinder <= 2000*		
					% Ethanol	<= 87 %		
					Positive (rising) Delta O2 voltage during previous 12.5ms is OR Negative (falling) Delta O2 voltage during previous 12.5ms is	> 5.0 millivolts		
			AND		**OR**			
			Bank 1 Filtered Post catalyst O2 voltage is NOT between Note: If the first voltage value is >= the second voltage value, this is an indication that the post catalyst O2 data is not used for diagnosis on this application.	1000 and 0 millivolts	Negative (falling) Delta O2 voltage during previous 12.5ms is	< -5.0 millivolts		
					For AFM (Cylinder Deactivation) vehicles only	No AFM state change during current 2.50 second sample period.		
					O2 sensor switches	>= 1 times during current 2.50 second sample period		
					Quality Factor	>= 0.95 in the current operating region		
					No EngineMisfireDetected_FA			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No MAP_SensorFA			
					No MAF_SensorFA			
					No ECT_Sensor_FA			
					No Ethanol Composition Sensor FA			
					No TPS_ThrottleAuthorityDefaulted			
					No FuelInjectorCircuit_FA			
					No AIR System FA			
					No O2S_Bank_1_Sensor_1_FA			
					No O2S_Bank_2_Sensor_1_FA			
					No EvapPurgeSolenoidCircuit_FA			
		Monitor Strategy Notes: The AFIM Filtered Length Ratio is derived from the pre-O2 sensor voltage metric known as String Length. String Length is simply the curve length of the O2 sensor voltage over a fixed time period of 2.50 seconds. The reason we use String Length is because it comprehends both O2 signal frequency and amplitude in one metric. The busier the O2 voltage (an indication of imbalance), the longer the String Length will be.	The AFIM Filtered Length Ratio is the difference between the measured String Length and a 17x17 table lookup value,divided by the same lookup 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 reason we use a ratio of the String Lengths is so that we can normalize the failure metric over various engine speed and load regions since engine speed and load directly impact pre-O2 String Length, especially when AFIM failures are present. In order to filter out signal noise (to avoid false failures), the Length Ratio is filtered using a common first-order lag filter. The result is the AFIM Filtered Length Ratio.	The Quality Factor (QF) calibrations are located in a 17x17 lookup table versus engine speed and load (see Supporting Tables). A QF of “1” is an indication that we were able to achieve at least 4sigma/2sigma robustness in that speed/load region. QF values less than “1” indicate that we don’t have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of String Length data. QF values less than 0.95 identify regions where diagnosis is not possible.	No EvapFlowDuringNonPurge_FA			
					No EvapVentSolenoidCircuit_FA			
					No EvapSmallLeak_FA			
					No EvapEmissionSystem_FA			
					No FuelTankPressureSensorCircuit_FA			
					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			
					Fuel Control Status			
					Closed Loop Long Term FT	for >= 1.0 seconds, and Enabled **Please see "Closed Loop Enable Criteria" and "Long Term FT Enable Criteria" in Supporting Tables.**		
					Cumulative (absolute) delta MAF during the current 2.50 second sample period is Note: This protects against false diagnosis during severe transient maneuvers.	*< 100 g/s* *Note: This protects against false diagnosis during severe transient maneuvers.*		
					Data collection is suspended under the following circumstances:	- for 1.0 seconds after AFM transitions - for 2.0 seconds after		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						Closed Loop transitions from Off to On - for 2.0 seconds after purge transitions from Off to On or On to Off - for 1.0 seconds after the AFIM diagnostic transitions from Disabled to Enabled		
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 < 800 mvolts AND 2) Accumulated air flow during stuck lean test > 47 grams.	No Active DTC's B1S2 Failed this key cycle System Voltage Learned heater resistance	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, P013B, P013E, P013F, P2270 or P2271 10.0 volts < system voltage< 32.0 volts = Valid	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. Green Sensor Delay Criteria The diagnostic will not be enabled	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					ICAT MAT Burnoff delay	= Not Valid	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 to initially enable test	1250 <= RPM <= 2300		
					Engine Speed range to keep test enabled (after initially enabled)	1100 <= RPM <= 2450		
					Engine Airflow	3 gps <= Airflow <= 12 gps		
					Vehicle Speed to initially enable test	34.2 mph <= Veh Speed <= 74.6 mph		
					Vehicle Speed range to keep test enabled (after initially enabled)	31.7 mph <= Veh Speed <= 82.0 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		
					EGR Intrusive diagnostic	= not active		
					All post sensor heater delays	= not active		
					O2S Heater on Time	>= 120.0 sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Predicted Catalyst temp	600 ºC <= Cat Temp <= 900 ºC		
					Fuel State	= DFCO possible		
					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 > 33 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_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = TRUE, multiple tests per trip are allowed.	2 trips Type B
					B1S2 Failed this key cycle	P013A, P013B, P013E, P013F or P2270		
					System Voltage	10.0 volts < system 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:	
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False	Airflow greater than 22 gps for 120000 grams of accumulated flow	
					Engine Speed	1250 <= RPM <= 2300		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Airflow	3 gps <= Airflow <= 12 gps	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	
					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		
					Fuel State	= DFCO possible		
					DTC's Passed	= P2270 (and P2272 (if applicable))		
					DTC's Passed	= P013E (and P014A (if applicable))		
					DTC's Passed	= P013A (and P013C (if applicable))		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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	Battery Voltage Low Pressure Pump Engine Run Time Additional Enable Conditions: 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
SIDI High Pressure Pump	P228D	Detects measured fuel rail pressure bias too high from desired fuel pressure	Desired Pressure - Measure Pressure	≤ -3.00 Mpa	Battery Voltage Low Pressure Pump Engine Run Time Additional Enable Conditions: 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
Secondary AIR System Pressure Sensor Circuit Bank 1	P2430	This DTC detects a stuck in range pressure sensor signal when the AIR pump is commanded on.	Average Error and Signal Variation	< 0.50 kPa < 0.15 kPa	BARO Inlet Air Temp Coolant Temp Engine off time System Voltage	> 60 kPa > -11.0 deg C. > -11.0 deg C. < 60.0 deg C. > 3600.0 seconds > 10.0 OR < 32.0 Volts	Stuck in range cumulative time > 5.0 seconds	2 trip(s) Type B
				disable	MAP	< 20 kPa for 2 seconds	Frequency: Once per trip when SAI	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
				conditions:	Engine Speed	> 5000 RPM	pump commanded On	
					MAF	> 50 gm/s for 3 seconds		
					No active DTCs:	AIRValveControlCircuit FA AIRPumpControlCircuit FA AIRSysPressSnsrB1CktLoFA AIRSysPressSnsrB1CktHiFA ControllerProcessorPerf_FA 5VoltReferenceA_FA 5VoltReferenceB_FA		
Secondary AIR System Pressure Sensor Performance Bank 1	P2431	This DTC detects a skewed pressure sensor signal via a comparison of the AIR pressure sensor signal and estimated BARO, as well as an evaluation of the quality of the comparison.	Difference between AIR pressure sensor and BARO (Pump Commanded Off)		BARO	> 60 kPa	Skewed sensor cumulative test weight > 5.0 seconds	2 trip(s)
					Inlet Air Temp	> -11.0 deg C.		
				> 14.0 kPa	Coolant Temp	> -11.0 deg C.		
				< -10.0 kPa		< 60.0 deg C.		Type B
			OR		Engine off time	> 3600.0 seconds		
			Difference between AIR pressure sensor and BARO (Pump Commanded On)		System Voltage	> 10.0 OR < 32.0 Volts	Continuous 6.25ms loop	
				> 50.0 kPa	**Skewed sensor cumulatative test weight is based on distance from the last Baro update** **Baro Skewed Sensor Weight Factor**			
				disable conditions:	MAP	< 20 kPa for 2 seconds		
					Engine Speed	> 5000 RPM		
					MAF	> 50 gm/s for 3 seconds		
					No active DTCs:	Transfer Case not in 4WD Low Run/crank active AIRValveControlCircuit FA AIRPumpControlCircuit FA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						AIRSysPressSnsrB1CktLoFA AIRSysPressSnsrB1CktHiFA MAF_SensorFA EngineMisfireDetected_FA ControllerProcessorPerf_FA 5VoltReferenceA_FA 5VoltReferenceB_FA		
Secondary AIR System Pressure Sensor Circuit Low Voltage Bank 1	P2432	This DTC detects an out of range low AIR pressure sensor signal	AIR Pressure Sensor signal	< 6 % of 5Vref disable conditions:	No active DTCs:	ControllerProcessorPerf_FA 5VoltReferenceA_FA 5VoltReferenceB_FA	800 failures out of 1000 samples 6.25 ms loop Continuous	2 trip(s) Type B
Secondary AIR System Pressure Sensor Circuit Hi Voltage Bank 1	P2433	This DTC detects an out of range high AIR pressure sensor signal	AIR Pressure Sensor signal	> 94 % of 5Vref **disable conditions:**	No active DTCs:	ControllerProcessorPerf_FA 5VoltReferenceA_FA 5VoltReferenceB_FA	800 failures out of 1000 samples 6.25 ms loop Continuous	2 trip(s) Type B
Secondary AIR System Shut-off Valve Stuck Open Single Bank System	P2440	This DTC detects if one or both of the AIR system control valves is stuck open This test is run during Phase 2 (Pump commanded On, valve commanded closed)	AIR pressure error	< **Bank 1 Valve Pressure Error** table or > 32.0 kPa	BARO > 60 kPa Inlet Air Temp > -11.0 deg C. Coolant Temp > -11.0 deg C. < 60.0 deg C. Engine off time > 3600.0 seconds System Voltage > 10.0 OR < 32.0 Volts Stability Time > 0.5 seconds AIR diagnostic Phase 1 passed **Conditional test weight is calculated by multiplying the following Factors** **Phase 2 Baro Test Weight Factor** **Phase 2 MAF Test Weight Factor** **Phase 2 System Volt Test Weight Factor**		Phase 2 Conditional test weight > 1.5 seconds Frequency: Once per trip when AIR	2 trip(s) Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Phase 2 Ambient Temp Test Weight Factor		pump commanded On	
				disable	MAP	< 20 kPa for 2 seconds		
				conditions:	Engine Speed	> 5000 RPM		
					MAF	> 50 gm/s for 3 seconds		
					No active DTCs:	AIRSystemPressureSensor FA AIRValveControlCircuit FA AIRPumpControlCircuit FA MAF_SensorFA AmbientAirDefault_NA IAT_SensorFA ECT_Sensor_FA EngineMisfireDetected_FA CatalystSysEfficiencyLoB1_FA CatalystSysEfficiencyLoB2_FA ControllerProcessorPerf_FA 5VoltReferenceA_FA 5VoltReferenceB_FA IgnitionOutputDriver_FA FuelInjectorCircuit_FA		
Secondary AIR System Pump Stuck On Single Bank System	P2444	This DTC detects if the SAI pump is stuck On This test is run during Phase 3 (Pump commanded Off, valve commanded closed)	AIR pressure error	> **Bank 1 Pump Pressure Error** table or < -32 kPa	BARO Inlet Air Temp Coolant Temp Engine off time System Voltage Stability Time	> 60 kPa > -11.0 deg C. > -11.0 deg C. < 60.0 deg C. > 3600.0 seconds > 10.0 OR < 32.0 Volts > 4.0 seconds AIR diagnostic Phase 1 passed	Phase 3 Cumlatative test weight > 2.0 seconds Frequency: Once per trip when AIR	2 trip(s) Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						AIR diagnostic Phase 2 passed	pump commanded On	
					Phase 3 cumulatative test weight is based on distance from the last Baro update **Baro Skewed Sensor Weight Factor**			
				disable **conditions:**	MAP Engine Speed MAF No active DTCs:	< 20 kPa for 2 seconds > 5000 RPM > 50 gm/s for 3 seconds AIRSystemPressureSensor FA AIRValveControlCircuit FA AIRPumpControlCircuit FA MAF_SensorFA AmbientAirDefault_NA IAT_SensorFA ECT_Sensor_FA EngineMisfireDetected_FA CatalystSysEfficiencyLoB1_FA CatalystSysEfficiencyLoB2_FA ControllerProcessorPerf_FA 5VoltReferenceA_FA 5VoltReferenceB_FA IgnitionOutputDriver_FA FuelInjectorCircuit_FA		
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 Performed every 12.5 msec	2 trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			OR					Type B
			Rolling count error - Serial Communication message ($199 - PPEI3) rolling count value	Message <> previous message rolling count value + one	Diagnostic enabled/disabled	Enabled	>= 6 Rolling count errors out of ten samples Performed every 12.5 msec	
			OR		Power Mode	= Run		
			RAM error - Serial Communication message ($199 - PPEI3)	Transmission torque request value or request type dual store not equal	Engine Running Run/Crank Active	= True > 0.50 Sec	>= 16 RAM errors out of 32 samples Performed every 12.5 msec	
			OR					
			Range Error - Serial Communication message - ($199 - PTEI3) TCM Requested Torque Increase	> 250 Nm			>= 6 out of 10 samples Performed every 12.5 msec	
			OR					
			Multi-transition error - Trans torque intervention type request change	Requested torque intervention type toggles from not increasing request to increasing request			>= 3 multi-transitions out of 5 samples Performed every 200 msec	
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:** Time difference between the current read and the previous read of the Timer	> 1.50 seconds	IAT Temperature No active DTCs: **Count Up Test:** Ignition key off OR Engine off	-256 °C ≤ Temperature ≤ 256 °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.	2 trips Type B DTC sets on next key cycle if failure detected.
			Range Test: The variation of the HWIO timer and mirror timer is	> 25 %	**Range Test:**			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			at controller shutdown.		ECM is powering down		**Range Test:** One time when the controller is powered down.	
		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.						
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 MAP_SensorFA ECT_Sensor_FA FuelInjectorCircuit_FA P0131, P0151 P0132, P0152 10.0 volts < system voltage< 32.0 volts	200 failures out of 250 samples. Frequency: Continuous 100msec loop	2 trips Type B
			A) O2S signal must be O2S signal To set Closed Loop ready flag	< 1250 mvolts = True				
			Closed Loop O2S ready flag	= True	System Voltage Engine Speed Engine Airflow Engine Coolant	500 RPM <= Engine speed <= 3400 RPM 3.2 gps <= Engine Airflow<= 30.0 gps >= 70.0 ºC		
			B) Once set to ready O2S cannot be O2S signal for time Then set Closed Loop ready flag	> 1250 mvolts > 5.0 seconds = False	Engine Metal Overtemp Active	= False		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Converter Overtemp Active Fuel State AFM Status Predicted Exhaust Temp (B1S1) Engine run time Fuel Enrichment **All of the above met for** Time	= False DFCO not active = All Cylinders active >= 0.0 ºC > 100 seconds = Not Active > 5 seconds		
Control Module Communication Bus A Off	U0073	This DTC monitors for a BUS A off condition	Bus off failures out of	≥ 5 counts ≥ 5 samples	CAN hardware is bus OFF for	≥ 0.0375 seconds	Diagnostic runs in 1000 ms loop	Type B 2 trips
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 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
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	11 volts ≤ Voltage ≤ 32 volts	The diagnostic runs in the 1000 ms loop	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					The bus has been on for A message has been selected to monitor.	> 3.0000 seconds		

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	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
-4.3750	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
1.2500	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
6.8750	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
12.5000	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
18.1250	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
23.7500	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
29.3750	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
35.0000	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
40.6250	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
46.2500	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
51.8750	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
57.5000	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
63.1250	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
68.7500	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
74.3750	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
80.0000	-311.3632	-311.3632	-311.3632	-311.3632	-311.3632	-293.3625	-275.3618	-257.3611	-239.6037	-221.6030	-203.6023	-185.6016	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453

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 Temperature

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	44	44	44	44	68	82	105	153	320	480	480	480	480	480	480	480	480

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

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	30
3	35
6	40
9	45
13	50
16	55
19	60
22	65
25	70
28	85
31	90
34	95
38	135
41	135
44	160
47	160
50	260
53	260
56	360
59	360
63	360
66	360
69	360
72	460
75	460
78	460
81	460
84	460
88	460
91	460
94	460
97	460
100	460

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	400	800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6600
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000

MAF Residual Weight Factor based on RPM

RPM	0	400	800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6600
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.941	0.933	0.790	0.852	0.751	0.591	0.528	0.000

MAF Residual Weight Factor Based on MAF Estimate

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	400	800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6600
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000

MAP2 Residual Weight Factor based on RPM

RPM	0	400	800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6600
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.925	1.000	1.000	1.000	1.000	1.000	1.000	0.000

MAP3 Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	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	400	800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6600
	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 Boost

% 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

Supercharger Intake Flow Rationality Diagnostic Failure Matrix						
TPS Model Failure	MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	SCIAP 1 Model Failure	SCIAP 2 Model Failure	DTC Set
F	F	F	F	F	F	No DTC
F	F	F	F	F	T	No DTC
F	F	F	F	T	F	No DTC
F	F	F	F	T	T	P012B
F	F	F	T	F	F	No DTC
F	F	F	T	F	T	P1101
F	F	F	T	T	F	P1101
F	F	F	T	T	T	P1101
F	F	T	F	F	F	No DTC
F	F	T	F	F	T	P1101
F	F	T	F	T	F	P1101
F	F	T	F	T	T	P1101
F	F	T	T	F	F	P0106
F	F	T	T	F	T	P1101
F	F	T	T	T	F	P1101
F	F	T	T	T	T	P1101
F	T	F	F	F	F	No DTC
F	T	F	F	F	T	P0101
F	T	F	F	T	F	No DTC
F	T	F	F	T	T	P0101, P012B
F	T	F	T	F	F	P1101
F	T	F	T	F	T	P0101
F	T	F	T	T	F	P1101
F	T	F	T	T	T	P0101, P012B
F	T	T	F	F	F	P1101
F	T	T	F	F	T	P1101
F	T	T	F	T	F	P1101
F	T	T	F	T	T	P1101
F	T	T	T	F	F	P1101
F	T	T	T	F	T	P1101
F	T	T	T	T	F	P1101
F	T	T	T	T	T	P1101
T	F	F	F	F	F	P0121
T	F	F	F	F	T	No DTC
T	F	F	F	T	F	P0121
T	F	F	F	T	T	P1101
T	F	F	T	F	F	P1101
T	F	F	T	F	T	P1101
T	F	F	T	T	F	P1101
T	F	F	T	T	T	P1101
T	F	T	F	F	F	P0121
T	F	T	F	F	T	P1101
T	F	T	F	T	F	P0121
T	F	T	F	T	T	P1101
T	F	T	T	F	F	P1101
T	F	T	T	F	T	P1101
T	F	T	T	T	F	P1101
T	F	T	T	T	T	P1101
T	T	F	F	F	F	P0121
T	T	F	F	F	T	P1101
T	T	F	F	T	F	P0121
T	T	F	F	T	T	P1101
T	T	F	T	F	F	P1101
T	T	F	T	F	T	P1101
T	T	F	T	T	F	P1101
T	T	F	T	T	T	P1101
T	T	T	F	F	F	P0121
T	T	T	F	F	T	P1101
T	T	T	F	T	F	P0121
T	T	T	F	T	T	P1101
T	T	T	T	F	F	P1101
T	T	T	T	F	T	P1101
T	T	T	T	T	F	P1101

Supercharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)						
TPS Model Failure	MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	SCIAP 1 Model Failure	SCIAP 2 Model Failure	DTC Set
T	T	T	T	T	T	P1101

Turbocharger Intake Flow Rationality Diagnostic Failure Matrix								
MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	MAP 3 Model Failure	TIAP 1 Model Failure	TPS Model Failure	TIAP Correlation Failure	TIAP Correlation Valid	DTC Set
F	F	F	F	F	F	F	F	No DTC
F	F	F	F	F	F	F	T	No DTC
F	F	F	F	F	F	T	F	No DTC
F	F	F	F	F	F	T	T	No DTC
F	F	F	F	F	T	F	F	No DTC
F	F	F	F	F	T	F	T	No DTC
F	F	F	F	F	T	T	F	No DTC
F	F	F	F	F	T	T	T	No DTC
F	F	F	F	T	F	F	F	No DTC
F	F	F	F	T	F	F	T	No DTC
F	F	F	F	T	F	T	F	No DTC
F	F	F	F	T	F	T	T	No DTC
F	F	F	F	T	T	F	F	P1101
F	F	F	F	T	T	F	T	P0121
F	F	F	F	T	T	T	F	P1101
F	F	F	F	T	T	T	T	P0236
F	F	F	T	F	F	F	F	P1101
F	F	F	T	F	F	F	T	P1101
F	F	F	T	F	F	T	F	P1101
F	F	F	T	F	F	T	T	P1101
F	F	F	T	F	T	F	F	P1101
F	F	F	T	F	T	F	T	P1101
F	F	F	T	F	T	T	F	P1101
F	F	F	T	F	T	T	T	P1101
F	F	F	T	T	F	F	F	P1101
F	F	F	T	T	F	F	T	P1101
F	F	F	T	T	F	T	F	P1101
F	F	F	T	T	F	T	T	P1101
F	F	F	T	T	T	F	F	P1101
F	F	F	T	T	T	T	F	P1101
F	F	F	T	T	T	T	T	P1101
F	F	T	F	F	F	F	F	P1101
F	F	T	F	F	F	F	T	P1101
F	F	T	F	F	F	T	F	P1101
F	F	T	F	F	F	T	T	P1101
F	F	T	F	F	T	F	F	P1101
F	F	T	F	F	T	F	T	P1101
F	F	T	F	F	T	T	F	P1101
F	F	T	F	F	T	T	T	P1101
F	F	T	F	T	F	F	F	P1101
F	F	T	F	T	F	F	T	P1101
F	F	T	F	T	F	T	F	P1101
F	F	T	F	T	F	T	T	P1101
F	F	T	F	T	T	F	F	P1101
F	F	T	F	T	T	F	T	P1101
F	F	T	F	T	T	T	F	P1101
F	F	T	F	T	T	T	T	P1101
F	F	T	T	F	F	F	F	P1101
F	F	T	T	F	F	F	T	P1101
F	F	T	T	F	F	T	F	P1101
F	F	T	T	F	F	T	T	P1101
F	F	T	T	F	T	F	F	P1101
F	F	T	T	F	T	F	T	P1101
F	F	T	T	F	T	T	F	P1101
F	F	T	T	F	T	T	T	P1101
F	F	T	T	T	F	F	F	P1101
F	F	T	T	T	F	F	T	P1101
F	F	T	T	T	F	T	F	P1101
F	F	T	T	T	F	T	T	P1101
F	F	T	T	T	T	F	F	P1101
F	F	T	T	T	T	F	T	P1101
F	F	T	T	T	T	T	F	P1101
F	F	T	T	T	T	T	T	P1101
F	F	T	T	T	F	F	F	No DTC

Turbocharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)								
MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	MAP 3 Model Failure	TIAP 1 Model Failure	TPS Model Failure	TIAP Correlation Failure	TIAP Correlation Valid	DTC Set
F	F	T	T	T	F	F	T	No DTC
F	F	T	T	T	F	T	F	No DTC
F	F	T	T	T	F	T	T	No DTC
F	F	T	T	T	T	F	F	P1101
F	F	T	T	T	T	F	T	P1101
F	F	T	T	T	T	T	F	P1101
F	F	T	T	T	T	T	T	P1101
F	T	F	F	F	F	F	F	P1101
F	T	F	F	F	F	F	T	P1101
F	T	F	F	F	F	T	F	P1101
F	T	F	F	F	F	T	T	P0236
F	T	F	F	F	T	F	F	P1101
F	T	F	F	F	T	F	T	P0121
F	T	F	F	F	T	T	F	P1101
F	T	F	F	F	T	T	T	P0236
F	T	F	F	T	F	F	F	P1101
F	T	F	F	T	F	F	T	P1101
F	T	F	F	T	F	T	F	P1101
F	T	F	F	T	F	T	T	P0236
F	T	F	F	T	T	F	F	P1101
F	T	F	F	T	T	F	T	P0121
F	T	F	F	T	T	T	F	P1101
F	T	F	F	T	T	T	T	P0236
F	T	F	T	F	F	F	F	P1101
F	T	F	T	F	F	F	T	P1101
F	T	F	T	F	F	T	F	P1101
F	T	F	T	F	F	T	T	P1101
F	T	F	T	F	T	F	F	P1101
F	T	F	T	F	T	F	T	P1101
F	T	F	T	F	T	T	F	P1101
F	T	F	T	F	T	T	T	P1101
F	T	F	T	T	F	F	F	P1101
F	T	F	T	T	F	F	T	P1101
F	T	F	T	T	F	T	F	P1101
F	T	F	T	T	F	T	T	P1101
F	T	F	T	T	T	F	F	P1101
F	T	F	T	T	T	F	T	P1101
F	T	F	T	T	T	T	F	P1101
F	T	F	T	T	T	T	T	P1101
F	T	T	F	F	F	F	F	P1101
F	T	T	F	F	F	F	T	P1101
F	T	T	F	F	F	T	F	P1101
F	T	T	F	F	F	T	T	P1101
F	T	T	F	F	T	F	F	P1101
F	T	T	F	F	T	F	T	P1101
F	T	T	F	F	T	T	F	P1101
F	T	T	F	F	T	T	T	P1101
F	T	T	F	T	F	F	F	P1101
F	T	T	F	T	F	F	T	P1101
F	T	T	F	T	F	T	F	P1101
F	T	T	F	T	F	T	T	P1101
F	T	T	F	T	T	F	F	P1101
F	T	T	F	T	T	F	T	P1101
F	T	T	F	T	T	T	F	P1101
F	T	T	F	T	T	T	T	P1101
F	T	T	T	F	F	F	F	P0106
F	T	T	T	F	F	F	T	P0106
F	T	T	T	F	F	T	F	P0106
F	T	T	T	F	F	T	T	P0106
F	T	T	T	F	T	F	F	P1101
F	T	T	T	F	T	F	T	P1101
F	T	T	T	F	T	T	F	P1101
F	T	T	T	F	T	T	T	P1101

Turbocharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)								
MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	MAP 3 Model Failure	TIAP 1 Model Failure	TPS Model Failure	TIAP Correlation Failure	TIAP Correlation Valid	DTC Set
F	T	T	T	T	F	F	F	P1101
F	T	T	T	T	F	F	T	P1101
F	T	T	T	T	F	T	F	P1101
F	T	T	T	T	F	T	T	P1101
F	T	T	T	T	T	F	F	P1101
F	T	T	T	T	T	F	T	P1101
F	T	T	T	T	T	T	F	P1101
F	T	T	T	T	T	T	T	P1101
T	F	F	F	F	F	F	F	P1101
T	F	F	F	F	F	F	T	P1101
T	F	F	F	F	F	T	F	P1101
T	F	F	F	F	F	T	T	P0236
T	F	F	F	F	T	F	F	P1101
T	F	F	F	F	T	F	T	P0121
T	F	F	F	F	T	T	F	P1101
T	F	F	F	F	T	T	T	P0236
T	F	F	F	T	F	F	F	P1101
T	F	F	F	T	F	F	T	P1101
T	F	F	F	T	F	T	F	P1101
T	F	F	F	T	F	T	T	P0236
T	F	F	F	T	T	F	F	P1101
T	F	F	F	T	T	F	T	P0121
T	F	F	F	T	T	T	F	P1101
T	F	F	F	T	T	T	T	P0236
T	F	F	T	F	F	F	F	P1101
T	F	F	T	F	F	F	T	P1101
T	F	F	T	F	F	T	F	P1101
T	F	F	T	F	F	T	T	P1101
T	F	F	T	F	T	F	F	P1101
T	F	F	T	F	T	F	T	P1101
T	F	F	T	F	T	T	F	P1101
T	F	F	T	F	T	T	T	P1101
T	F	F	T	T	F	F	F	P1101
T	F	F	T	T	F	F	T	P1101
T	F	F	T	T	F	T	F	P1101
T	F	F	T	T	F	T	T	P1101
T	F	F	T	T	T	F	F	P1101
T	F	F	T	T	T	F	T	P1101
T	F	F	T	T	T	T	F	P1101
T	F	F	T	T	T	T	T	P1101
T	F	T	F	F	F	F	F	P1101
T	F	T	F	F	F	F	T	P1101
T	F	T	F	F	F	T	F	P1101
T	F	T	F	F	F	T	T	P1101
T	F	T	F	F	T	F	F	P1101
T	F	T	F	F	T	F	T	P1101
T	F	T	F	F	T	T	F	P1101
T	F	T	F	F	T	T	T	P1101
T	F	T	F	T	F	F	F	P1101
T	F	T	F	T	F	F	T	P1101
T	F	T	F	T	F	T	F	P1101
T	F	T	F	T	F	T	T	P1101
T	F	T	F	T	T	F	F	P1101
T	F	T	F	T	T	F	T	P1101
T	F	T	F	T	T	T	F	P1101
T	F	T	F	T	T	T	T	P1101
T	F	T	T	F	F	F	F	P1101
T	F	T	T	F	F	F	T	P1101
T	F	T	T	F	F	T	F	P1101
T	F	T	T	F	F	T	T	P1101
T	F	T	T	F	T	F	F	P1101
T	F	T	T	F	T	F	T	P1101
T	F	T	T	F	T	T	F	P1101
T	F	T	T	F	T	T	T	P1101

Turbocharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)								
MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	MAP 3 Model Failure	TIAP 1 Model Failure	TPS Model Failure	TIAP Correlation Failure	TIAP Correlation Valid	DTC Set
T	F	T	T	F	T	T	T	P1101
T	F	T	T	T	F	F	F	P0101
T	F	T	T	T	F	F	T	P0101
T	F	T	T	T	F	T	F	P0101
T	F	T	T	T	F	T	T	P0101
T	F	T	T	T	T	F	F	P1101
T	F	T	T	T	T	F	T	P1101
T	F	T	T	T	T	T	F	P1101
T	F	T	T	T	T	T	T	P1101
T	T	F	F	F	F	F	F	P1101
T	T	F	F	F	F	F	T	P1101
T	T	F	F	F	F	T	F	P1101
T	T	F	F	F	F	T	T	P0236
T	T	F	F	F	T	F	F	P1101
T	T	F	F	F	T	F	T	P0121
T	T	F	F	F	T	T	F	P1101
T	T	F	F	F	T	T	T	P0236
T	T	F	F	T	F	F	F	P1101
T	T	F	F	T	F	F	T	P1101
T	T	F	F	T	F	T	F	P1101
T	T	F	F	T	T	F	T	P0121
T	T	F	F	T	T	T	F	P1101
T	T	F	F	T	T	T	T	P0236
T	T	F	T	F	F	F	F	P1101
T	T	F	T	F	F	F	T	P1101
T	T	F	T	F	F	T	F	P1101
T	T	F	T	F	F	T	T	P1101
T	T	F	T	F	T	F	F	P1101
T	T	F	T	F	T	F	T	P1101
T	T	F	T	F	T	T	F	P1101
T	T	F	T	F	T	T	T	P1101
T	T	F	T	T	F	F	F	P1101
T	T	F	T	T	F	F	T	P1101
T	T	F	T	T	F	T	F	P1101
T	T	F	T	T	F	T	T	P1101
T	T	F	T	T	T	F	F	P1101
T	T	F	T	T	T	F	T	P1101
T	T	F	T	T	T	T	F	P1101
T	T	F	T	T	T	T	T	P1101
T	T	T	F	F	F	F	F	P1101
T	T	T	F	F	F	F	T	P1101
T	T	T	F	F	F	T	F	P1101
T	T	T	F	F	F	T	T	P1101
T	T	T	F	F	T	F	F	P1101
T	T	T	F	F	T	F	T	P1101
T	T	T	F	F	T	T	F	P1101
T	T	T	F	T	F	F	F	P1101
T	T	T	F	T	F	F	T	P1101
T	T	T	F	T	F	T	F	P1101
T	T	T	F	T	F	T	T	P1101
T	T	T	F	T	T	F	F	P1101
T	T	T	F	T	T	F	T	P1101
T	T	T	F	T	T	T	F	P1101
T	T	T	F	T	T	T	T	P1101
T	T	T	T	F	F	F	F	P1101
T	T	T	T	F	F	F	T	P1101
T	T	T	T	F	F	T	F	P1101
T	T	T	T	F	F	T	T	P1101
T	T	T	T	F	T	F	F	P1101
T	T	T	T	F	T	F	T	P1101

Turbocharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)								
MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	MAP 3 Model Failure	TIAP 1 Model Failure	TPS Model Failure	TIAP Correlation Failure	TIAP Correlation Valid	DTC Set
T	T	T	T	F	T	T	F	P1101
T	T	T	T	F	T	T	T	P1101
T	T	T	T	T	F	F	F	P1101
T	T	T	T	T	F	F	T	P1101
T	T	T	T	T	F	T	F	P1101
T	T	T	T	T	F	T	T	P1101
T	T	T	T	T	T	F	F	P1101
T	T	T	T	T	T	F	T	P1101
T	T	T	T	T	T	T	F	P1101
T	T	T	T	T	T	T	T	P1101

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	0.0333	0.0333	0.0333	0.0333
1000	0.0350	0.0350	0.0350	0.0350
1500	0.0340	0.0340	0.0340	0.0340
2000	0.0380	0.0380	0.0380	0.0380
2500	0.0435	0.0435	0.0435	0.0435
3000	0.0496	0.0496	0.0496	0.0496
3500	0.0591	0.0591	0.0591	0.0591
4000	0.0605	0.0605	0.0605	0.0605
4500	0.0713	0.0713	0.0713	0.0713
5000	0.0722	0.0722	0.0722	0.0722
5500	0.0817	0.0817	0.0817	0.0817
6000	0.0838	0.0838	0.0838	0.0838
6500	0.0842	0.0842	0.0842	0.0842
7000	0.0842	0.0842	0.0842	0.0842
7500	0.0842	0.0842	0.0842	0.0842
8000	0.0842	0.0842	0.0842	0.0842
8500	0.0842	0.0842	0.0842	0.0842

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 the second sensor
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 range

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 Methoc

	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
OpenTestThreshLo	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

AFIM Section _ Ian MacEwen

KtOXYD_cmp_AFIM_LngthThrsh1

AvgFlow / AvgRPM	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500	4000	4500	5000	6000
40	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000
80	80000	80000	22592	22592	22256	23008	22496	22000	23504	23008	23280	24816	22144	21280	21280	80000	80000
120	80000	80000	22592	22592	22256	23008	22496	22000	23504	23008	23280	24816	22144	21280	21280	80000	80000
160	80000	80000	23728	23728	30128	23248	23504	25504	25616	26096	22496	24496	30704	20976	20976	80000	80000
200	80000	80000	32080	32080	33312	29920	28000	27472	25568	24992	21248	22256	33184	19920	19920	80000	80000
240	80000	80000	34768	34768	35120	31072	36688	34624	32144	36112	25376	29568	32480	22240	22240	80000	80000
280	80000	80000	48480	48480	30544	31408	36400	33712	40080	29024	26720	25328	31744	26992	22240	80000	80000
320	80000	80000	51936	51936	35904	31888	31936	32576	34576	33968	27920	31344	29664	29664	80000	80000	80000
360	80000	80000	36048	36048	36864	32272	40096	37216	37040	36784	31088	29248	29456	29664	80000	80000	80000
400	80000	80000	28352	28352	31104	37168	29744	33136	27296	31424	32672	30704	30704	80000	80000	80000	80000
440	80000	80000	26256	26256	33840	27808	28400	31808	30496	30192	35392	33040	30704	80000	80000	80000	80000
480	80000	80000	24512	24512	25264	24992	26496	33520	27152	28672	35392	35392	80000	80000	80000	80000	80000
520	80000	80000	24512	24512	26848	28448	28752	38064	26288	26288	80000	80000	80000	80000	80000	80000	80000
560	80000	80000	80000	80000	28448	28416	28384	33232	26288	26288	80000	80000	80000	80000	80000	80000	80000
640	80000	80000	80000	80000	80000	28384	28384	28384	80000	80000	80000	80000	80000	80000	80000	80000	80000
720	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000
800	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000

KtOXYD_cmp_AFIM_LngthThrsh1_DoD (AFM applications only)

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_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_cmp_AFIM_LngthThrsh2_DoD (AFM applications only)

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	1.00	1.00	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	1.00	1.00	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	1.00	1.00	0.00	0.00	0.00
240	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00
280	0.00	0.00	0.00	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
360	0.00	0.00	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
400	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
440	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
480	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	0.00
520	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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_QualFactor1_DoD (AFM applications only)

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

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

KtOXYD_K_AFIM_QualFactor2_DoD (AFM applications only)

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_ClosedLoopAu (HYBRID ONLY)

AutoStart 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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Tables supporting Clutch Diagnostics

P0806

EngTorqueThreshold Table — **AXIS is Percent Clutch Petal Position, 0 = bottom of travel**

Axis	**0**	**6.2485**	**12.497**	**18.7455**	**24.994**	**31.2425**	**37.491**	**43.7395**	**49.988**	**56.2365**	**62.485**	**68.7335**	**74.982**	**81.2305**	**87.479**	**93.7275**	**99.976**
Curve	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

P0806

ResidualErrorEnableLow Table — **AXIS is Gear**

Axis	1st	2nd	3rd	4th	5th	6th	rev	neutral
Curve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

P0806

ResidualErrorEnableHigh Table — **AXIS is Gear**

Axis	1st	2nd	3rd	4th	5th	6th	rev	neutral
Curve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Tables supporting AIR Diagnostics

P0411

SL Threshold Bank 1 Table — **axis is average engine airflow during test in gm/sec**

Axis	**0.0**	**3.0**	**6.0**	**9.0**	**12.0**	**15.0**	**18.0**	**21.0**	**24.0**	**27.0**	**30.0**	**33.0**	**36.0**	**39.0**	**42.0**	**45.0**	**48.0**
Curve	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

P0411

Phase 1 Baro Test Weight Factor — **axis is Baro in Kpa**

Axis	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**
Curve	0.0	0.0	0.5	1.0	1.0	1.0	1.0	1.0	0.0

P0411

Phase 1 MAF Test Weight Factor — axis is engine airflow in gm/sec

Axis	0.0	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0
Curve	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0

P0411

Phase 1 System Volt Test Weight Factor — axis is system volts

Axis	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
Curve	0.0	0.0	0.0	0.0	0.0	0.5	0.8	1.0	1.0	1.0	1.0	1.0	0.8	0.5	0.5	0.5	0.5

P0411

Phase 1 Amb Temp Test Weight Factor — axis is Deg C

Axis	-30	-20	-10	0	10	20	30	40	50
Curve	0.0	0.0	0.0	0.5	1.0	1.0	1.0	1.0	1.0

P2431

Baro Skewed Sensor Weight Factor — axis is distance traveled from last Baro update in Km

Axis	0.0	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0
Curve	1.0	0.8	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

P2440

Bank 1 Valve Pressure Error — axis weighted time in seconds

Axis	0	1	2	3	4	5	6	7	8
Curve	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0

P2440

Phase 2 Baro Test Weight Factor — axis is Baro in Kpa

Axis	40	50	60	70	80	90	100	110	120
Curve	0.0	0.0	0.5	1.0	1.0	1.0	1.0	1.0	0.0

P2440

Phase 2 MAF Test Weight Factor — axis is engine airflow in gm/sec

Axis	0.0	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0
Curve	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0

P2440

Phase 2 System Volt Test Weight Factor — axis is system volts

Axis	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
Curve	0.0	0.0	0.0	0.0	0.0	0.5	0.8	1.0	1.0	1.0	1.0	1.0	0.8	0.5	0.5	0.5	0.5

P2440

Phase 2 Amb Temp Test Weight Factor — axis is Deg C

Axis	-30	-20	-10	0	10	20	30	40	50
Curve	0.0	0.0	0.0	0.5	1.0	1.0	1.0	1.0	1.0

P2444

Bank 1 Pump Pressure Error — axis weighted time in seconds

Axis	0	1	2	3	4	5	6	7	8
Curve	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

P2444 — Include only if duel bank system

Bank 2 Pump Pressure Error — axis weighted time in seconds

Axis	0	1	2	3	4	5	6	7	8
Curve	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Define Close Loop Enable Conditions

KtFSTA_t_ClosedLoopAut (HYBRID ONLY)

AutoStart 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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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_Purg OnAirMode5	CeFADR_e_ Cell01_Purg OnAirMode4	CeFADR_e_ Cell02_Purg OnAirMode3	CeFADR_e_ Cell03_Purg OnAirMode2	CeFADR_e_ Cell04_Purg OnAirMode1	CeFADR_e_ Cell05_Purg OnAirMode0	CeFADR_e_ Cell06_Purg OnIdle	CeFADR_e_ Cell07_Purg OnDecel	CeFADR_e_ Cell08_Purg OffAirMode5	CeFADR_e_ Cell09_Purg OffAirMode4	CeFADR_e_ Cell10_Purg OffAirMode3	CeFADR_e_ Cell11_Purg OffAirMode2	CeFADR_e_ Cell12_Purg OffAirMode1	CeFADR_e_ Cell13_Purg OffAirMode0	CeFADR_e_ Cell14_Purg OffIdle	CeFADR_e_ Cell15_Purg OffDecel
FASD Cell Usage	CeFADD_e_ SelectedPurg eCell	CeFADD_e_ SelectedPurg eCell	CeFADD_e_ SelectedPurg eCell	CeFADD_e_ SelectedPurg eCell	CeFADD_e_ SelectedPurg eCell	CeFADD_e_ SelectedPurg eCell	CeFADD_e_ SelectedPurg eCell	CeFADD_e_ NonSelected Cell	CeFADD_e_ SelectedNon PurgeCell	CeFADD_e_ SelectedNon PurgeCell	CeFADD_e_ SelectedNon PurgeCell	CeFADD_e_ SelectedNon PurgeCell	CeFADD_e_ SelectedNon PurgeCell	CeFADD_e_ SelectedNon PurgeCell	CeFADD_e_ SelectedNon PurgeCell	CeFADD_e_ NonSelected Cell
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 conditions

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

	IAT Range Low	Hi	-40	-28	-16	-4	8	20	32	44	56	68	80
Primary	10.0 ° C	52.0 ° C	13444	12112	10780	9448	8116	6784	5452	4120	2788	1456	124
Alternate	-7.0 ° C	10.0 ° C	15155	13715	12275	10835	9395	7955	6515	5075	3635	2195	755

P0128: Maximum Accumulated Time for IAT and Start-up ECT conditions

Z axis is the accumulated time failure threshold (seconds)
THMR Only — X axis is ECT Temperature at Power up (° C)
Y axis is IAT min during test (° C)

	IAT Range Low	Hi	-40	-28	-16	-4	8	20	32	44	56	68	80
Primary	10.0 ° C	65.0 ° C	1000	850	800	600	550	400	375	350	325	250	200
Alternate	-7.0 ° C	10.0 ° C	800	650	600	450	400	300	275	250	225	150	100

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

load
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 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
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 Load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	4500	4500	4000	1700	1200	700	600	450	300	175	75	85	80
9	4500	4500	4900	2000	1300	700	450	425	300	175	100	85	80
11	4500	4500	4900	2000	1600	700	450	425	300	175	100	85	80
12	4500	4500	4900	2000	1600	900	550	500	300	175	100	85	80
13	4500	4500	4900	2000	1600	1200	800	500	300	175	100	85	80
15	4500	4500	4000	1700	1600	1500	950	500	350	225	125	85	80
17	4500	4500	4000	1700	1500	1500	1100	1000	450	225	150	100	80
19	4500	4500	4000	1700	1500	1500	1100	1000	450	250	175	120	100
22	4500	4500	4000	1700	1500	1600	1100	1000	550	450	275	130	100
25	4500	4500	4000	2150	1500	1600	1100	1000	750	700	500	150	120
29	4500	4500	4000	2400	1500	1600	1100	1000	900	750	500	160	135
33	4500	4500	4500	3000	1800	1800	1100	1000	900	750	500	200	150
38	4500	4500	4500	3500	2000	1800	1100	1000	900	750	500	250	180
42	5000	5000	5000	4000	3000	2500	1500	1400	1000	750	500	300	210
48	5500	5500	5500	4500	3500	3000	2500	2000	1400	750	500	350	260
54	6000	6000	6000	5000	4000	3500	2500	2500	1600	750	500	400	300
60	6500	6500	6500	5500	4500	4000	3000	3000	2000	750	600	450	350

P0300-P0308: Idle Cyl Mode ddt

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	4500	4500	4000	1600	1300	700	600	840	400	300	175	80	110
9	4500	4500	4000	2000	1300	700	600	450	450	300	175	90	110
11	4500	4500	4900	2000	1600	800	800	500	475	300	200	120	110
12	4500	4500	4900	2000	1600	1000	800	575	475	300	200	120	110
13	4500	4500	4900	2000	1600	1300	1200	575	400	300	200	130	110
15	4500	4500	4000	1800	1600	1500	1200	575	450	375	200	145	110
17	4500	4500	4000	2100	1500	1500	1200	700	600	400	225	170	125
19	4500	4500	4000	2200	2000	1500	1200	1000	600	450	275	200	175
22	4500	4500	4000	2500	2100	1800	1300	1000	750	500	310	225	200
25	4500	4500	4000	2500	2100	2500	1300	1200	1050	750	525	275	250
29	4500	4500	4000	3400	2600	3000	1300	1200	1050	750	525	325	250
33	5500	5500	5500	4000	3500	3800	1600	1300	1050	750	525	400	300
38	6000	6000	6000	4500	3500	3800	1800	1500	1050	750	550	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
7	1800	1800	1800	1200	1150	725	575	550	400	175	125	85	75	70	30	20	20
9	1800	1800	1800	1200	1150	725	575	550	400	175	125	85	75	70	40	25	22
11	1800	1800	1800	1600	1150	725	575	550	400	175	125	85	75	70	40	25	22
12	1800	1800	1800	1600	1000	750	575	550	400	175	125	85	75	70	40	30	25
13	1800	1800	1800	1600	1000	750	575	550	400	175	125	85	75	70	40	35	30
15	1800	1800	1800	1600	1000	800	575	550	400	180	125	85	75	70	45	40	30
17	1800	1800	1800	1700	1000	800	600	550	400	225	150	100	80	70	50	45	35
19	1800	1800	1800	1700	1000	800	700	550	400	250	175	120	100	70	55	50	45
22	1800	1800	1800	1700	1040	970	750	600	450	250	200	130	100	75	70	55	50
25	3500	3500	3500	2150	1200	1200	800	750	550	250	250	150	120	95	80	65	55
29	3500	3500	3500	2400	1400	1600	800	800	700	375	250	160	135	110	90	75	60
33	4500	4500	4500	3000	1800	1800	1000	900	700	400	250	200	150	120	100	85	70
38	4500	4500	4500	3500	2000	1800	1100	1000	800	600	350	250	180	145	120	100	80
42	5000	5000	5000	4000	3000	2500	1500	1400	1000	600	375	300	210	160	135	125	100
48	5500	5500	5500	4500	3500	3000	2500	2000	1400	600	500	350	260	225	175	125	100
54	6000	6000	6000	5000	4000	3500	2500	2500	1600	700	500	400	300	220	175	150	125
60	6500	6500	6500	5500	4500	4000	3000	3000	2000	800	600	450	350	275	185	175	145

Load	3000	3500	4000	4500	5000	5500	6000	6500	7000
7	20	12	22	12	13	11	10	8	7
9	22	12	10	11	12	7	10	8	7
11	20	13	10	10	10	7	7	8	7
12	20	15	10	9	7	7	7	7	7
13	25	17	11	9	6	6	7	7	7
15	30	19	12	9	6	5	7	7	7
17	30	20	12	10	7	6	7	7	7
19	40	24	15	10	8	6	6	7	7
22	40	25	17	11	9	7	7	7	7
25	50	30	19	12	10	8	7	7	7
29	50	32	22	17	12	8	8	7	7
33	60	35	25	17	13	10	8	7	7
38	70	45	27	20	15	11	9	7	7
42	80	50	35	25	17	13	11	8	8
48	80	60	40	26	19	15	13	9	9
54	100	70	45	31	22	18	14	14	14
60	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
7	1400	1400	1400	1200	1200	725	600	840	500	300	175	125	110	90	55	40	40
9	1400	1400	1400	1200	1200	725	600	550	500	300	175	125	110	90	60	45	35
11	1500	1500	1500	1500	1200	800	800	550	500	300	200	125	110	90	60	45	35
12	1800	1800	1800	1300	1200	900	800	575	500	300	200	125	110	90	60	45	35
13	1800	1800	1800	1400	1200	1000	800	575	500	300	200	130	110	90	60	50	40
15	1800	1800	1800	1600	1400	1300	800	575	500	300	200	145	110	90	80	75	50
17	1800	1800	1800	2100	1500	1300	800	700	600	300	225	170	125	110	90	75	50
19	2000	2000	2000	2200	2000	1300	900	1000	600	450	275	200	175	135	110	100	60
22	2400	2400	2400	2500	2100	1800	1300	1000	750	500	310	225	200	150	150	125	80
25	3800	3800	3800	2500	2100	2500	1300	1300	1000	800	475	275	250	200	180	125	110
29	4000	4000	4000	3400	2600	3000	1300	1300	1200	800	475	325	250	250	225	140	125
33	5500	5500	5500	4000	3500	3800	1600	1400	1200	800	500	400	300	250	225	175	150
38	6000	6000	6000	4500	3500	3800	1800	1500	1200	1200	525	500	350	350	225	200	200
42	8000	8000	8000	5000	4000	4000	2400	2000	1400	1200	625	500	400	350	300	200	200
48	9000	9000	9000	5500	5000	5000	3000	2500	2000	1200	700	650	500	450	300	225	220
54	9000	9000	9000	6000	5500	5500	3500	3000	2200	1200	750	650	600	450	350	300	250
60	9500	9500	9500	6500	6000	6000	4000	3500	2600	1200	800	700	650	450	350	300	250

load

	3000	3500	4000	4500	5000	5500	6000	6500	7000
7	30	22	22	13	13	11	10	12	12
9	30	20	14	14	12	10	10	12	12
11	25	23	16	14	10	10	10	11	11
12	33	24	18	14	11	10	10	11	11
13	35	27	20	14	11	10	10	11	11
15	40	27	22	15	12	10	10	11	11
17	40	30	24	18	13	10	11	10	10
19	60	30	27	18	15	12	11	10	10
22	70	35	27	25	17	13	11	10	10
25	100	45	42	30	20	16	13	10	10
29	110	55	50	35	25	20	15	11	11
33	125	65	60	40	30	22	17	13	13
38	125	75	60	50	40	30	19	14	14
42	175	85	70	60	40	35	22	16	16
48	175	100	90	65	45	40	24	20	20
54	200	125	100	70	55	45	35	25	25
60	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
7	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	23	20	15	11
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	26	20	15	14
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32	24	17	14
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	34	26	17	17
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	40	30	20	18
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	45	35	25	20
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	50	35	25	22
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	55	40	30	25
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	60	50	35	30
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	70	50	40	30
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	85	60	45	40
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	95	70	50	40
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	110	80	60	50
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	125	100	70	55
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	140	100	80	60
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	140	110	90	70
60	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	165	110	100	80

P0300-P0308: Rev Mode Table (Con't)

OR (decel index > Rev Mode Table)

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

P0300-P0308: AFM Mode Table

OR (decel index > AFM Table if active fuel management)

Load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800
7	32767	32767	32767	32767	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	32767	32767	32767	32767
11	32767	32767	32767	32767	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	32767	32767	32767	32767
13	32767	32767	32767	32767	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	32767	32767	32767	32767
17	32767	32767	32767	32767	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	32767	32767	32767	32767
22	32767	32767	32767	32767	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	32767	32767	32767	32767
29	32767	32767	32767	32767	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	32767	32767	32767	32767
38	32767	32767	32767	32767	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	32767	32767	32767	32767
48	32767	32767	32767	32767	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	32767	32767	32767	32767
60	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

Load	3000	3500	4000	4500	5000	5500	6000	6500	7000
7	32767	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767
60	32767	32767	32767	32767	32767	32767	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	7.50
800	7.50
900	7.50
1000	7.50
1100	7.50
1200	7.50
1400	7.50
1600	7.50
1800	8.00
2000	8.00
2200	8.00
2400	8.00
2600	8.00
2800	8.00
3000	8.50
3500	10.87
4000	13.24
4500	15.61
5000	17.98
5500	20.35
6000	22.72
6500	25.09
7000	27.46

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
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 table

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	0.030	0.045	0.060	0.075	0.090	0.105	0.120	0.135	0.150	0.165	0.180	0.195	0.210	0.225	0.240	1.000
0.000	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.030	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.045	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.060	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.075	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.090	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.105	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.120	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
0.135	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
0.150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.195	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.240	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

P0153 - O2S Slow Response Bank 2 Sensor 1" Pass/Fail Threshold table

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	0.030	0.045	0.060	0.075	0.090	0.105	0.120	0.135	0.150	0.165	0.180	0.195	0.210	0.225	0.240	1.000
0.000	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.030	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.045	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.060	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.075	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.090	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.105	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
0.120	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
0.135	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
0.150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.195	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.240	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 table

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	27	27	27	27	27
6.3	27	27	27	27	27
12.5	27	27	27	27	27
18.8	27	27	27	27	27
25.0	27	27	27	27	27
31.3	27	27	27	27	27
37.5	27	27	27	27	27
43.8	27	27	27	27	27
50.0	27	27	27	27	27
56.3	27	27	27	27	27
62.5	27	27	27	27	27
68.8	27	27	27	27	27
75.0	27	27	27	27	27
81.3	27	27	27	27	27
87.5	27	27	27	27	27
93.8	27	27	27	27	27
100.0	27	27	27	27	27

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

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	27	27	27	27	27
6.3	27	27	27	27	27
12.5	27	27	27	27	27
18.8	27	27	27	27	27
25.0	27	27	27	27	27
31.3	27	27	27	27	27
37.5	27	27	27	27	27
43.8	27	27	27	27	27
50.0	27	27	27	27	27
56.3	27	27	27	27	27
62.5	27	27	27	27	27
68.8	27	27	27	27	27
75.0	27	27	27	27	27
81.3	27	27	27	27	27
87.5	27	27	27	27	27
93.8	27	27	27	27	27
100.0	27	27	27	27	27

P1153 - O2S HC L to R Switches Limit Bank 2 Sensor 1" Pass/Fail Threshold table

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	27	27	27	27	27
6.3	27	27	27	27	27
12.5	27	27	27	27	27
18.8	27	27	27	27	27
25.0	27	27	27	27	27
31.3	27	27	27	27	27
37.5	27	27	27	27	27
43.8	27	27	27	27	27
50.0	27	27	27	27	27
56.3	27	27	27	27	27
62.5	27	27	27	27	27
68.8	27	27	27	27	27
75.0	27	27	27	27	27
81.3	27	27	27	27	27
87.5	27	27	27	27	27
93.8	27	27	27	27	27
100.0	27	27	27	27	27

P1153 - O2S HC R to L Switches Limit Bank 2 Sensor 1" Pass/Fail Threshold table

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	27	27	27	27	27
6.3	27	27	27	27	27
12.5	27	27	27	27	27
18.8	27	27	27	27	27
25.0	27	27	27	27	27
31.3	27	27	27	27	27
37.5	27	27	27	27	27
43.8	27	27	27	27	27
50.0	27	27	27	27	27
56.3	27	27	27	27	27
62.5	27	27	27	27	27
68.8	27	27	27	27	27
75.0	27	27	27	27	27
81.3	27	27	27	27	27
87.5	27	27	27	27	27
93.8	27	27	27	27	27
100.0	27	27	27	27	27

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

CATD Section Rob Genslak

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

Define Close Loop

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	19	19	19	19	19	19	0	0	0	0	0	0	0

KtEGRD_p_StepDelta

X axis is Kpa BARO

65	70	75	80	85	90	95	100	105
3.1953	3.1953	3.1953	3.1953	3.1953	3.1953	3.1953	3.1953	3.1953

KtEGRD_p_StepMAP_DIFF

X axis is Kpa BARO

65	70	75	80	85	90	95	100	105
0.6797	0.7188	0.7578	0.7969	0.8359	0.8750	0.9141	0.9531	1.0000

KtEGRD_Cnt_StepSamplesPerTrip

X axis is Kpa BARO

65	70	75	80	85	90	95	100	105
7.0000	7.0000	7.0000	5.0000	3.0000	3.0000	3.0000	3.0000	3.0000

KtEGRD_Cnt_SamplesAfterStep

X axis is Kpa BARO

65	70	75	80	85	90	95	100	105
20.0000	20.0000	20.0000	15.0000	10.0000	10.0000	10.0000	10.0000	10.0000

KtEGRD_Cnt_SamplesAfterReset

X axis is Kpa BARO

65	70	75	80	85	90	95	100	105
20.0000	20.0000	20.0000	15.0000	10.0000	10.0000	10.0000	10.0000	10.0000

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_phi_CamPosErrorLimIc2

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

KtPHSD_phi_CamPosErrorLimEc2

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

KtPHSD_t_StablePositionTimeIc2

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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

KtPHSD_t_StablePositionTimeEc2

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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Tables supporting Engine Oil Temperature Sensor

P0196

FastFailTempDiff — **AXIS is Engine Coolant Temperature at ECM Power-up, Degrees C**

Axis	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Curve	80.0	80.0	80.0	60.0	60.0	40.0	40.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

TotalAccumulatedFlow — **Axis is Power up Engine Oil temperature, Curve is accumulated engine grams airflow**

Axis	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Curve	15000	14000	13000	12000	11000	10000	9000	8000	7000	6000	5000	4000	5000	4000	3000	3000	3000

Tables supporting Deactivation System Performance

P3400

EngSpeedLwrLimitEnableTable — **AXIS is Gear State, Curve is Nm Torque**

Axis	1st Gear	2nd Gear	3rd Gear	4th Gear	5thGear	6th Gear	Neutral	Reverse	Park
Curve	1025.0	1025.0	1025.0	1025.0	1025.0	1025.0	1025.0	1025.0	1025.0

EngSpeedUprLimitEnableTable — **AXIS is Gear State, Curve is Nm Torque**

Axis	1st Gear	2nd Gear	3rd Gear	4th Gear	5thGear	6th Gear	Neutral	Reverse	Park
Curve	2200.0	2200.0	2200.0	2200.0	2200.0	2200.0	2200.0	2200.0	2200.0

EngSpeedLwrLimitDisableTable — **AXIS is Gear State, Curve is Nm Torque**

Axis	1st Gear	2nd Gear	3rd Gear	4th Gear	5thGear	6th Gear	EVT1	EVT2	Neutral	Reverse	Park
Curve	800	800	800	800	800	800	800	800	800	800	800

EngSpeedUprLimitDisableTable — **AXIS is Gear State, Curve is Nm Torque**

Axis	1st Gear	2nd Gear	3rd Gear	4th Gear	5thGear	6th Gear	EVT1	EVT2	Neutral	Reverse	Park
Curve	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400

EngSpeedDisableLwrLimitTable — **AXIS is Gear State, Curve is Nm Torque**

Axis	1st Gear	2nd Gear	3rd Gear	4th Gear	5thGear	6th Gear	EVT1	EVT2	Neutral	Reverse	Park
Curve	800	1025	1025	1025	1025	1025	1025	1025	1025	1025	1025

EngSpeedDisableUprLimitTable — **AXIS is Gear State, Curve is Nm Torque**

Axis	1st Gear	2nd Gear	3rd Gear	4th Gear	5thGear	6th Gear	EVT1	EVT2	Neutral	Reverse	Park
Curve	2400	2200	2200	2200	2200	2200	2200	2200	2200	2400	2400

HalfCylToAllCylVacuum — **Horizontal AXIS is Gear State, Vertical axis is Engine RPM**

RPM	1st Gear	2nd Gear	3rd Gear	4th Gear	5th Gear	6th Gear	EVT1	EVT2	Neutral	Park	Reverse
0.0	90	90	73	70	90	90	90	90	4	4	4
100.0	84	84	73	70	84	84	84	84	4	4	4
200.0	78	78	69	66	78	78	78	78	4	4	4
300.0	73	73	64	61	73	73	73	73	4	4	4
400.0	67	67	60	57	67	67	67	67	4	4	4
500.0	61	61	55	52	61	61	61	61	4	4	4
600.0	55	55	51	48	55	55	55	55	4	4	4
700.0	48	48	46	43	48	48	48	48	4	4	4
800.0	41	41	42	39	41	41	41	41	4	4	4
900.0	34	34	37	34	34	34	34	34	4	4	4
1000.0	26	26	33	30	26	26	26	26	4	4	4
1100.0	19	19	28	25	19	19	19	19	4	4	4
1200.0	12	12	24	21	12	12	12	12	4	4	4
1300.0	11	11	19	16	11	11	11	11	4	4	4
1400.0	9	9	15	12	9	9	9	9	4	4	4
1500.0	8	8	10	7	8	8	8	8	4	4	4
1600.0	7	7	8	6	7	7	7	7	4	4	4
1700.0	5	5	5	5	5	5	5	5	4	4	4
1800.0	4	4	5	5	4	4	4	4	4	4	4
1900.0	4	4	5	5	4	4	4	4	4	4	4
2000.0	4	4	5	5	4	4	4	4	4	4	4
2100.0	4	4	5	5	4	4	4	4	4	4	4
2200.0	4	4	5	5	4	4	4	4	4	4	4
2300.0	4	4	5	5	4	4	4	4	4	4	4
2400.0	4	4	5	5	4	4	4	4	4	4	4
2500.0	4	4	5	5	4	4	4	4	4	4	4
2600.0	4	4	5	5	4	4	4	4	4	4	4
2700.0	4	4	5	5	4	4	4	4	4	4	4
2800.0	4	4	5	5	4	4	4	4	4	4	4
2900.0	4	4	5	5	4	4	4	4	4	4	4
3000.0	4	4	5	5	4	4	4	4	4	4	4
3100.0	4	4	5	5	4	4	4	4	4	4	4
3200.0	4	4	5	5	4	4	4	4	4	4	4

EcoHalfCylToAllCylVacuum **Horizontal AXIS is Gear State, Vertical axis is Engine RPM**

RPM	1st Gear	2nd Gear	3rd Gear	4th Gear	5th Gear	6th Gear	EVT1	EVT2	Neutral	Park	Reverse
0.0	4	4	4	4	4	4	4	4	4	4	4
100.0	4	4	4	4	4	4	4	4	4	4	4
200.0	4	4	4	4	4	4	4	4	4	4	4
300.0	4	4	4	4	4	4	4	4	4	4	4
400.0	4	4	4	4	4	4	4	4	4	4	4
500.0	4	4	4	4	4	4	4	4	4	4	4
600.0	4	4	4	4	4	4	4	4	4	4	4
700.0	4	4	4	4	4	4	4	4	4	4	4
800.0	4	4	4	4	4	4	4	4	4	4	4
900.0	4	4	4	4	4	4	4	4	4	4	4
1000.0	4	4	4	4	4	4	4	4	4	4	4
1100.0	4	4	4	4	4	4	4	4	4	4	4
1200.0	4	4	4	4	4	4	4	4	4	4	4
1300.0	4	4	4	4	4	4	4	4	4	4	4
1400.0	4	4	4	4	4	4	4	4	4	4	4
1500.0	4	4	4	4	4	4	4	4	4	4	4
1600.0	4	4	4	4	4	4	4	4	4	4	4
1700.0	4	4	4	4	4	4	4	4	4	4	4
1800.0	4	4	4	4	4	4	4	4	4	4	4
1900.0	4	4	4	4	4	4	4	4	4	4	4
2000.0	4	4	4	4	4	4	4	4	4	4	4
2100.0	4	4	4	4	4	4	4	4	4	4	4
2200.0	4	4	4	4	4	4	4	4	4	4	4

EcoHalfCylToAllCylVacuum (Con't) **Horizontal AXIS is Gear State, Vertical axis is Engine RPM**

2300.0	4	4	4	4	4	4	4	4	4	4	4
2400.0	4	4	4	4	4	4	4	4	4	4	4
2500.0	4	4	4	4	4	4	4	4	4	4	4
2600.0	4	4	4	4	4	4	4	4	4	4	4
2700.0	4	4	4	4	4	4	4	4	4	4	4
2800.0	4	4	4	4	4	4	4	4	4	4	4
2900.0	4	4	4	4	4	4	4	4	4	4	4
3000.0	4	4	4	4	4	4	4	4	4	4	4
3100.0	4	4	4	4	4	4	4	4	4	4	4
3200.0	4	4	4	4	4	4	4	4	4	4	4

HalfCylDisabledPRNDL

PRNDL Drive 1	1
PRNDL Drive 2	1
PRNDL Drive 3	1
PRNDL Drive 4	0
PRNDL Drive 5	1
PRNDL Drive 6	1
PRNDL Neutral	1
PRNDL Reverse	1
PRNDL Park	1
PRNDL Transitional 1	1
PRNDL Transitional 2	1
PRNDL Transitional 4	1
PRNDL Transitional 7	1
PRNDL Transitional 8	1
PRNDL Transitional 11	1
PRNDL Transitional 13	1
PRNDL Transitional Illegal	1
PRNDL Transitional Between State	1

HalfCylDisabledPRNDLDeviceControl

PRNDL Drive 1	1
PRNDL Drive 2	1
PRNDL Drive 3	1
PRNDL Drive 4	0
PRNDL Drive 5	1
PRNDL Drive 6	1
PRNDL Neutral	0
PRNDL Reverse	1
PRNDL Park	0
PRNDL Transitional 1	1
PRNDL Transitional 2	1
PRNDL Transitional 4	1
PRNDL Transitional 7	1
PRNDL Transitional 8	1
PRNDL Transitional 11	1
PRNDL Transitional 13	1
PRNDL Transitional Illegal	1
PRNDL Transitional Between State	1

HalfCylDisabledTransGr Table — AXIS is Gear State

Axis	1st Gear	2nd Gear	3rd Gear	4th Gear	5thGear	6th Gear	EVT1	EVT2	Neutral	Reverse	Park
Curve	1	1	0	0	0	0	0	0	0	1	0

AllCylDisabledTransGr Table — AXIS is Gear State

Axis	1st Gear	2nd Gear	3rd Gear	4th Gear	5thGear	6th Gear	EVT1	EVT2	Neutral	Reverse	Park
Curve	1	1	0	0	0	0	0	0	1	1	1

AllCylToHalfCylVacuum — Horizontal AXIS is Gear State, Vertical axis is Engine RPM

RPM	1st Gear	2nd Gear	3rd Gear	4th Gear	5th Gear	6th Gear	EVT1	EVT2	Neutral	Park	Reverse
0.0	100	100	100	100	100	100	100	100	48	48	48
100.0	100	100	100	100	100	100	100	100	48	48	48
200.0	97	97	99	96	97	97	97	97	48	48	48
300.0	90	90	95	92	90	90	90	90	48	48	48
400.0	83	83	91	88	83	83	83	83	48	48	48
500.0	77	77	88	85	77	77	77	77	48	48	48
600.0	70	70	84	81	70	70	70	70	48	48	48
700.0	68	68	80	77	68	68	68	68	48	48	48
800.0	66	66	76	73	66	66	66	66	48	48	48
900.0	64	64	72	69	64	64	64	64	48	48	48
1000.0	61	61	68	65	61	61	61	61	48	48	48
1100.0	59	59	64	61	59	59	59	59	48	48	48
1200.0	57	57	61	58	57	57	57	57	48	48	48
1300.0	51	51	57	54	51	51	51	51	48	48	48
1400.0	47	47	53	50	47	47	47	47	48	48	48
1500.0	46	46	49	46	46	46	46	46	48	48	48
1600.0	46	46	48	46	46	46	46	46	48	48	48
1700.0	46	46	46	46	46	46	46	46	48	48	48
1800.0	46	46	46	46	46	46	46	46	48	48	48
1900.0	46	46	46	46	46	46	46	46	48	48	48
2000.0	46	46	46	46	46	46	46	46	48	48	48
2100.0	46	46	46	46	46	46	46	46	48	48	48
2200.0	46	46	46	46	46	46	46	46	48	48	48
2300.0	46	46	46	46	46	46	46	46	48	48	48
2400.0	46	46	46	46	46	46	46	46	48	48	48
2500.0	46	46	46	46	46	46	46	46	48	48	48
2600.0	46	46	46	46	46	46	46	46	48	48	48
2700.0	46	46	46	46	46	46	46	46	48	48	48
2800.0	46	46	46	46	46	46	46	46	48	48	48
2900.0	46	46	46	46	46	46	46	46	48	48	48
3000.0	46	46	46	46	46	46	46	46	48	48	48
3100.0	46	46	46	46	46	46	46	46	48	48	48
3200.0	46	46	46	46	46	46	46	46	48	48	48

EcoAllCylToHalfCylVacuum **Horizontal AXIS is Gear State, Vertical axis is Engine RPM**

RPM	1st Gear	2nd Gear	3rd Gear	4th Gear	5th Gear	6th Gear	EVT1	EVT2	Neutral	Park	Reverse
0.0	60	60	60	60	60	60	60	60	60	60	60
100.0	59	59	59	59	59	59	59	59	59	59	59
200.0	58	58	58	58	58	58	58	58	58	58	58
300.0	57	57	57	57	57	57	57	57	57	57	57
400.0	56	56	56	56	56	56	56	56	56	56	56
500.0	55	55	55	55	55	55	55	55	55	55	55
600.0	54	54	54	54	54	54	54	54	54	54	54
700.0	53	53	53	53	53	53	53	53	53	53	53
800.0	53	53	53	53	53	53	53	53	53	53	53
900.0	53	53	53	53	53	53	53	53	53	53	53
1000.0	52	52	52	52	52	52	52	52	52	52	52
1100.0	52	52	52	52	52	52	52	52	52	52	52
1200.0	51	51	51	51	51	51	51	51	51	51	51
1300.0	52	52	52	52	52	52	52	52	52	52	52
1400.0	53	53	53	53	53	53	53	53	53	53	53
1500.0	53	53	53	53	53	53	53	53	53	53	53
1600.0	53	53	53	53	53	53	53	53	53	53	53
1700.0	52	52	52	52	52	52	52	52	52	52	52
1800.0	51	51	51	51	51	51	51	51	51	51	51
1900.0	51	51	51	51	51	51	51	51	51	51	51
2000.0	50	50	50	50	50	50	50	50	50	50	50
2100.0	50	50	50	50	50	50	50	50	50	50	50
2200.0	50	50	50	50	50	50	50	50	50	50	50
2300.0	50	50	50	50	50	50	50	50	50	50	50
2400.0	51	51	51	51	51	51	51	51	51	51	51
2500.0	51	51	51	51	51	51	51	51	51	51	51
2600.0	51	51	51	51	51	51	51	51	51	51	51
2700.0	51	51	51	51	51	51	51	51	51	51	51
2800.0	51	51	51	51	51	51	51	51	51	51	51
2900.0	51	51	51	51	51	51	51	51	51	51	51
3000.0	51	51	51	51	51	51	51	51	51	51	51
3100.0	51	51	51	51	51	51	51	51	51	51	51
3200.0	51	51	51	51	51	51	51	51	51	51	51

P0521

EngSpeedWeightFactorTable **AXIS is Engine RPM, Curve is Weight Factor**

Axis	0	500	900	1000	1500	1750	2000	3500	4000
Curve	0	0	0	0	0	0	0	0	0

EngOilTempWeightFactorTable **AXIS is Engine Oil Temp Deg C, Curve is Weight Factor**

Axis	-40	40	60	80	90	100	120	130	140
Curve	1	1	1	1	1	1	1	1	0

EngLoadStabilityWeightFactorTable **AXIS is Engine RPM, Curve is Weight Factor**

Axis	0	5	10	20	30	50	100	200	399
Curve	1	1	1	0	0	0	0	0	0

EngOilPredictionWeightFacotrTable **AXIS is Engine RPM, Curve is Engine Oil Prediction Weight Factor Ratio**

Axis	0	170	250	275	360	375	400	500	600
Curve	0	0	0	1	1	1	1	1	0

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	56.2969	42.0078	34.1016	29.0859	30.3125	23.4219	23.4922	255.0000	255.0000

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	23.1641	16.9531	16.1641	18.4219	21.7734	26.9453	36.1797	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	61.0000	75.0000	80.9141	85.0000	94.0000	116.0000	130.0000	140.0000

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	14.0000	31.0000	70.0000	117.0000	180.0000	212.0000	240.0000	240.0000	240.0000

P1682: Ignition Voltage Correleation

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)

X-axis	CePISR_e_6 p25msSeq	CePISR_e_1 2P5msSeq	CePISR_e_2 5msSeq
Data	0.2000	0.2000	0.2000

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

X-axis	CePISR_e_6 p25msSeq	CePISR_e_1 2P5msSeq	CePISR_e_2 5msSeq
Data	0.2000	0.2000	0.2000

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

X-axis	CePISR_e_6 p25msSeq	CePISR_e_1 2P5msSeq	CePISR_e_2 5msSeq
Data	1.0000	1.0000	0.0000

P16F3

P16F3: No fast unmanaged retarded spark above the applied spark

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	62.23	58.86	54.56	55.91	55.86	55.75	56.78	60.30	65.83	70.66	74.80	76.80	65.28	43.11	40.78	40.78	40.78
160.00	57.41	51.56	43.28	42.17	41.31	41.08	43.78	47.88	53.11	53.72	54.11	55.70	48.52	34.41	32.92	32.92	32.92
240.00	53.27	45.91	35.91	33.86	32.73	32.47	35.64	39.70	44.52	42.94	41.44	42.98	38.27	28.61	27.59	27.59	27.59
320.00	49.69	41.31	29.80	27.88	26.97	26.86	30.06	33.92	38.31	35.83	33.42	34.23	30.95	24.44	23.77	23.77	23.77
400.00	44.13	35.42	24.77	23.23	22.72	22.89	26.00	29.61	33.63	30.58	27.67	28.34	26.02	21.34	20.86	20.86	20.86
480.00	38.61	30.64	21.17	19.77	19.53	19.95	22.91	26.27	29.97	26.70	23.61	24.17	22.47	18.95	18.59	18.59	18.59
560.00	34.33	26.98	18.48	17.20	17.14	17.67	20.42	23.42	26.61	23.50	20.58	21.08	19.78	17.05	16.77	16.77	16.77
640.00	30.91	24.11	16.41	15.22	15.27	15.86	18.41	21.06	23.83	20.95	18.25	18.69	17.67	15.48	15.27	15.27	15.27
720.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14
800.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14
880.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14
960.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14
1040.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14
1120.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14
1200.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14
1280.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14
1360.00	28.39	22.03	14.92	13.81	13.92	14.55	16.92	19.34	21.81	19.09	16.58	16.98	16.14	14.33	14.14	14.14	14.14

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

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	23.4219	23.4219	23.4219	23.4219	23.4219	23.4219

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	218.0000	218.0000	218.0000	218.0000	218.0000	218.0000
375.0000	50.0000	35.0000	25.0000	25.0000	25.0000	25.0000
525.0000	50.0000	35.0000	25.0000	25.0000	25.0000	25.0000
625.0000	50.0000	35.0000	25.0000	25.0000	25.0000	25.0000
825.0000	50.0000	35.0000	25.0000	25.0000	25.0000	25.0000
1025.0000	50.0000	35.0000	25.0000	25.0000	25.0000	25.0000
1225.0000	50.0000	35.0000	25.0000	25.0000	25.0000	25.0000
1425.0000	50.0000	35.0000	20.0000	15.0000	5.0000	5.0000
1625.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2125.0000	-0.5000	-5.0000	-8.0000	-10.0000	-12.7500	-12.7500
2625.0000	-2.7500	-7.2500	-10.0000	-12.2500	-15.0000	-15.0000
3125.0000	-4.7500	-9.2500	-12.2500	-14.2500	-17.2500	-17.2500
3625.0000	-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
4625.0000	-0.7500	-5.2500	-8.2500	-10.5000	-13.2500	-13.2500
5125.0000	-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
30.0	30.0	30.0	10.0	10.0	10.0	20.0	30.0	30.0

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

FASD Section_Ian MacEwen

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

	CeFADR_e_ Cell00_Purg	CeFADR_e_ Cell01_Purg	CeFADR_e_ Cell02_Purg	CeFADR_e_ Cell03_Purg	CeFADR_e_ Cell04_Purg	CeFADR_e_ Cell05_Purg	CeFADR_e_ Cell06_Purg	CeFADR_e_ Cell07_Purg	CeFADR_e_ Cell08_Purg	CeFADR_e_ Cell09_Purg	CeFADR_e_ Cell10_Purg	CeFADR_e_ Cell11_Purg	CeFADR_e_ Cell12_Purg	CeFADR_e_ Cell13_Purg	CeFADR_e_ Cell14_Purg	CeFADR_e_ Cell15_Purg
Cell I.D.	OnAirMode5	OnAirMode4	OnAirMode3	OnAirMode2	OnAirMode1	OnAirMode0	OnIdle	OnDecel	OffAirMode5	OffAirMode4	OffAirMode3	OffAirMode2	OffAirMode1	OffAirMode0	OffIdle	OffDecel
	CeFADD_e_ SelectedPurg	CeFADD_e_ SelectedPurg	CeFADD_e_ SelectedPurg	CeFADD_e_ SelectedPurg	CeFADD_e_ SelectedPurg	CeFADD_e_ SelectedPurg	CeFADD_e_ SelectedPurg	CeFADD_e_ NonSelected	CeFADD_e_ SelectedNon	CeFADD_e_ SelectedNon	CeFADD_e_ SelectedNon	CeFADD_e_ SelectedNon	CeFADD_e_ SelectedNon	CeFADD_e_ SelectedNon	CeFADD_e_ SelectedNon	CeFADD_e_ NonSelected
FASD Cell Usage	eCell	eCell	eCell	eCell	eCell	eCell	eCell	Cell	PurgeCell	PurgeCell	PurgeCell	PurgeCell	PurgeCell	PurgeCell	PurgeCell	Cell
FASD Enabled In Cell?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO

Closed Loop Enable Criteria

Engine run time greater than
KtFSTA_t_ClosedLoopAut (HYBRID ONLY)

AutoStart 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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

and
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

and pre converter 02 sensor voltage less than
KfFULC_U_O2_SensorReadyThrshLo

	< 1250
Voltage	*milliVolts*

for
KcFULC_O2_SensorReadyEvents

(events * 12.5 milliseconds)	*> 20 events*

and
COSC (Converter Oxygen Storage Control) not enabled
and
Consumed AirFuel Ratio is stoichiometry i.e. not in component protection
and
POPD or Catalyst Diagnostic not intrusive
and
Turbo Scavenging Mode not enabled
and
All cylinders whose valves are active also have their injectors enabled
and
O2S_Bank_ 1_TFTKO, O2S_Bank_ 2_TFTKO, FuelInjectorCircuit_FA and CylnderDeacDriverTFTKO = False

Long Term FT Enable Criteria

Closed Loop Enable and
Coolant greater than
KfFCLL_T_AdaptiveLoCoolant

	> 40 Celcius
Coolant	

or less than
KfFCLL_T_AdaptiveHiCoolant

	< 120
Coolant	*Celcius*

and
KtFCLL_p_AdaptiveLowMAP_Limit

Barometric Pressure	65	70	75	80	85	90	95	100	105
Manifold Air Pressure	14.0	14.0	14.0	15.5	17.0	18.5	20.0	20.0	20.0

and
TPS_ThrottleAuthorityDefaulted = False
and
Flex Fuel Estimate Algorithm is not active
and
Excessive fuel vapors boiling off from the engine oil algorithm (BOFR) is not enabled
and
Catalyst or EVAP large leak test not intrusive

Secondary Fuel Trim Enable Criteria

Closed Loop Enable and
KfFCLP_U_O2ReadyThrshLo

	< 1100
Voltage	*milliVolts*

for
KcFCLP_Cnt_O2RdyCyclesThrsh

(events * 12.5 milliseconds)	*> 80 events*

Long Term Secondary Fuel Trim Enable Criteria

KtFCLP_t_PostIntglDisableTime										X10 Y10	X11 Y11	X12 Y12	X13 Y13	X14 Y14	X15 Y15	X16 Y16	X17 Y17
Start-Up Coolant	-40	-29	-18	-6	5	16	28	39	50	61	73	84	95	106	118	129	140
Post Integral Enable Time	250.0	250.0	250.0	250.0	250.0	250.0	250.0	200.0	150.0	100.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0

Plus

KtFCLP_t_PostIntglRampInTime										X10 Y10	X11 Y11	X12 Y12	X13 Y13	X14 Y14	X15 Y15	X16 Y16	X17 Y17
Start-Up Coolant	-40	-29	-18	-6	5	16	28	39	50	61	73	84	95	106	118	129	140
Post Integral Ramp In Time	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	40.0	30.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0

and

KeFCLP_T_IntegrationCatalystMax

Modeled Catalyst Tempera	*< 1000 Celcius*

and

KeFCLP_T_IntegrationCatalystMin

Modeled Catalyst Tempera	*> 0 Celcius*

and

PO2S_Bank_1_Snsr_2_FA and PO2S_Bank_2_Snsr_2_FA = False

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	P219A							
A/F Imbalance Bank2	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					

Cert Doc Bundle Name	Pcodes																		
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

Cert Doc Bundle Name	Pcodes		
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	

Cert Doc Bundle Name	Pcodes
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

Cert Doc Bundle Name	Pcodes
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 GetFULI GetFULI GetFAD GetFAD 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

Cert Doc Bundle Name	Pcodes
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.
Fuel Rail Pressure (FRP) Sensor Performance (rationality)	P018B	This DTC detects a fuel pressure sensor response stuck within the normal operating range	Absolute value of change in fuel pressure as sensed during intrusive test.	<= 30 kPa	1. FRP Circuit Low DTC (P018C) 2. FRP Circuit High DTC (P018D) 3. FuelPump Circuit Low DTC (P0231) 4. FuelPump Circuit High DTC (P0232) 5. FuelPump Circuit Open DTC (P023F) 6. Reference Voltage DTC (P0641) 7. Fuel Pump Control Module Driver Over-temperature DTC's (P064A, P1255) 8. Control Module Internal Performance DTC (P0606) 9. Engine run time 10. Emissions fuel level (PPEI $3FB) AND Engine Run Time 11. Fuel pump control	not active not active not active not active not active not active not active >=5 seconds not low > 30 sec enabled	<u>Frequency:</u> 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 Duration of intrusive test is fueling related (5 to 12 seconds). Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	DTC Type A 1 trip

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					12. Fuel pump control state 13. Engine fuel flow 14. ECM fuel control system failure (PPEI $1ED)	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 enabled enabled 9V < voltage < 32V	72 test failures in 80 test samples if Fuel Pump Current <100A 3 test failures in 15 test samples if Fuel Pump Current >=100A 1 sample/12.5 ms	DTC Type A 1 trip
Fuel Pump Control Circuit High Voltage	P0232	This DTC detects if the fuel pump control circuit is shorted to high	Voltage measured at fuel pump circuit	> 3.86 V	Commanded fuel pump output Fuel pump control enable Time that above conditions are met	0% duty cycle (off) False >=4.0 seconds	36 test failures in 40 test samples; 1 sample/12.5ms Pass/Fail determination made only once per trip	DTC Type A 1 trip
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< 32V	72 test failures in 80 test samples; 1 sample/12.5ms	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 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 OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	1 failure Frequency: Once at power-up	DTC Type A 1 trip
Control Module Random Access Memory (RAM)	P0604	Indicates that control module is unable to correctly write and read data to and from RAM	Data read	≠ Data written	Ignition 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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Control Module Internal Performance 1. Main Processor Configuration Register 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	Incorrect value.	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	Tests 1 and 2 1 failure Frequency: Continuously (12.5ms)	DTC Type A 1 trip
2. Processor clock test			2. For Processor Clock Fault: •EE latch flag in EEPROM. OR • RAM latch flag.	0x5A5A 0x5A	1. For all I/O configuration register faults: •KeMEMD_b_ProcFltCfgRegEnbl 2. For Processor Clock Fault: •KeMEMD_b_ProcFltCLKDiagEnbl	TRUE TRUE	Test 3 3 failures out of 15 samples 1 sample/12.5 ms	
3. External watchdog test			3. For External Watchdog Fault: • Software control of fuel pump driver	Control Lost	3. For External Watchdog Fault: •KeFRPD_b_FPExtWDogDiagEnbl 3. For External Watchdog Fault: •Control Module ROM(P0601) 3. For External Watchdog Fault: •Control Module RAM(P0604)	TRUE not active 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
5Volt Reference Circuit (Short High/Low/Out of Range)	P0641	Detects continuous short or out of range on the #1 5V sensor reference circuit	Reference voltage AND Output OR Reference voltage AND Output	>= 0.5V inactive . >= 5.5V active	Ignition	Run or Crank	15 failures out of 20 samples 1 sample/12.5 ms	DTC Type A 1 trip

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			OR Reference voltage AND Output	<= 4.5V active				
			OR Reference voltage □	> 102.5% nominal (i.e., 5.125V) OR <97.5% nominal (i.e., 4.875V)				
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 Continental 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 AND Ignition Run / Crank KeFRPD_b_FPOverTempDiagEnbl	Run or Crank Enabled Enabled 9V<voltage<32V TRUE	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
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 AND Ignition Run / Crank KeFRPD_b_FPOverTempDiagEnbl	Run or Crank Enabled Enabled 9V<voltage<32V TRUE	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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel Pump Flow Performance (rationality)	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) OR >= High Threshold (function of desired fuel rail pressure and fuel flow rate. 15% of resultant Target Pressure) **(See Supporting Tables tab)**	1. FRP Circuit Low DTC (P018C)	not active	Filtered fuel rail pressure error Time Constant = 12.5 seconds Frequency: Continuous 12.5 ms loop	DTC Type B 2 trips
					2. FRP Circuit High DTC (P018D)	not active		
					3. Fuel Pressure Sensor Performance DTC (P018B)	not active		
					4. FuelPump Circuit Low DTC (P0231)	not active		
					5. FuelPump Circuit High DTC (P0232)	not active		
					6. FuelPump Circuit Open DTC (P023F)	not active		
					7. Reference Voltage DTC (P0641)	not active		
					8. Fuel Pump Control Module Driver Over-temperature DTC's	not active		
					9. Control Module Internal Performance DTC (P0606)	not active		
					10. An ECM fuel control system failure (PPEI $1ED)	has not occurred		
					11. The Barometric pressure (PPEI $4C1) signal	valid (for absolute fuel pressure sensor)		
					12. Engine run time	>= 30 seconds		
					13. Emissions fuel level (PPEI $3FB) AND Engine Run Time	not low > 30 sec		
					14. Fuel pump control	enabled		
					15. Fuel pump control state	normal		
					16. Battery Voltage	11V<=voltage=<32V		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					17. Fuel flow rate **(See Supporting Tables tab)**	> 0.047 g/s **AND** <= Max allowed fuel flow rate as a function of desired rail pressure & Vbatt (Typical values in the range of 11 to 50 g/s)		
					18. Fuel Pressure Control System	Is not responding to an over-pressurization due to pressure build during DFCO or a decreasing desired pressure command.		
Control Module Communication Bus "A" Off	U0073	Detects that a CAN serial data bus shorted condition has occurred to force the CAN device driver to enter a bus-off state	Bus Status	Off	Power mode	Run/Crank	5 failures out of 5 samples (5 seconds)	DTC Type B 2 trips
Lost Communication With ECM/PCM "A"	U0100	Detects that CAN serial data communication has been lost with the ECM	Message $0C9	Undetected	1. Power mode 2. Ignition Run/Crank Voltage 3. U0073	Run/Crank 11V<=voltage=<32V not active	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips

P2635 Fuel Pump Performance Maximum Fuel Flow map (grams / s)

X-axis= Desired Fuel Pressure (kiloPascals)
Y-axis= Battery voltage (volts)

	200	250	300	350	400	450	500	550	600
4.5	13.89844	13.89844	13.89844	13.89844	12.49219	9.648438	6.882813	4.1875	1.5625
6	13.89844	13.89844	13.89844	13.89844	12.49219	9.648438	6.882813	4.1875	1.5625
7.5	13.89844	13.89844	13.89844	13.89844	12.49219	9.648438	6.882813	4.1875	1.5625
9	13.89844	13.89844	13.89844	13.89844	12.49219	9.648438	6.882813	4.1875	1.5625
10.5	13.89844	13.89844	13.89844	13.89844	12.49219	9.648438	6.882813	4.1875	1.5625
12	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	12.99219	10.21875	7.515625
13.5	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.47656
15	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
16.5	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
18	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
19.5	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
21	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
22.5	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
24	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
25.5	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
27	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844
28.5	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844	13.89844

P2635 Fuel Pump Performance Filtered Pressure Error Fault Threshold High map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)
Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
0	30	37.5	45	52.5	60	67.5	75	82.5	90
1.5	30	37.5	45	52.5	60	67.5	75	82.5	90
3	30	37.5	45	52.5	60	67.5	75	82.5	90
4.5	30	37.5	45	52.5	60	67.5	75	82.5	90
6	30	37.5	45	52.5	60	67.5	75	82.5	90
7.5	30	37.5	45	52.5	60	67.5	75	82.5	90
9	30	37.5	45	52.5	60	67.5	75	82.5	90
10.5	30	37.5	45	52.5	60	67.5	75	82.5	90
12	30	37.5	45	52.5	60	67.5	75	82.5	90
13.5	30	37.5	45	52.5	60	67.5	75	82.5	90
15	30	37.5	45	52.5	60	67.5	75	82.5	90
16.5	30	37.5	45	52.5	60	67.5	75	82.5	90
18	30	37.5	45	52.5	60	67.5	75	82.5	90
19.5	30	37.5	45	52.5	60	67.5	75	82.5	90
21	30	37.5	45	52.5	60	67.5	75	82.5	90
22.5	30	37.5	45	52.5	60	67.5	75	82.5	90
24	30	37.5	45	52.5	60	67.5	75	82.5	90
25.5	30	37.5	45	52.5	60	67.5	75	82.5	90
27	30	37.5	45	52.5	60	67.5	75	82.5	90
28.5	30	37.5	45	52.5	60	67.5	75	82.5	90
30	30	37.5	45	52.5	60	67.5	75	82.5	90
31.5	30	37.5	45	52.5	60	67.5	75	82.5	90
33	30	37.5	45	52.5	60	67.5	75	82.5	90
34.5	30	37.5	45	52.5	60	67.5	75	82.5	90
36	30	37.5	45	52.5	60	67.5	75	82.5	90
37.5	30	37.5	45	52.5	60	67.5	75	82.5	90
39	30	37.5	45	52.5	60	67.5	75	82.5	90
40.5	30	37.5	45	52.5	60	67.5	75	82.5	90
42	30	37.5	45	52.5	60	67.5	75	82.5	90
43.5	30	37.5	45	52.5	60	67.5	75	82.5	90
45	30	37.5	45	52.5	60	67.5	75	82.5	90
46.5	30	37.5	45	52.5	60	67.5	75	82.5	90
48	30	37.5	45	52.5	60	67.5	75	82.5	90

P2635 Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold High map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)
Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
0	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
1.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
3	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
4.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
6	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
7.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
9	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
10.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
12	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
13.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
15	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
16.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
18	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
19.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
21	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
22.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
24	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
25.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
27	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
28.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
30	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
31.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
33	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
34.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
36	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
37.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
39	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
40.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
42	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
43.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
45	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
46.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
48	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5

P2635 Fuel Pump Performance Filtered Pressure Error Fault Threshold Low map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)
Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
0	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
1.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
3	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
4.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
6	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
7.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
9	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
10.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
12	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
13.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
15	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
16.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
18	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
19.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
21	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
22.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
24	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
25.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
27	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
28.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
30	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
31.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
33	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
34.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
36	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
37.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
39	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
40.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
42	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
43.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
45	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
46.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
48	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90

P2635 Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold Low map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)
Y-axis= Fuel Flow (grams / s)

	200	250	300	350	400	450	500	550	600
0	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
1.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
3	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
4.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
6	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
7.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
9	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
10.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
12	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
13.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
15	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
16.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
18	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
19.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
21	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
22.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
24	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
25.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
27	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
28.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
30	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
31.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
33	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
34.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
36	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
37.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
39	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
40.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
42	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
43.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
45	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
46.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
48	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5