COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Intake Camshaft Actuator Solenoid Circuit – Bank 1	P0010	Detects a VVT system error by monitoring the circuit for electrical integrity	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		System supply voltage is within limits Output driver is commanded on, Ignition switch is in crank or run position	> 11 Volts, and < 32 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B 2 trips
Intake Camshaft System Performance – Bank 1	P0011	Detects a VVT system error by comparing the desired and actual cam positions when VVT is activated	Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive	(Intake cam Bank 1)Cam Position Error > KtPHSD_phi_CamPosErrorLimIc 1 Deg (see Supporting Table)	The following DTC's are NOT active: P0010 IntkCMP B1 Circuit P0340, P0341, Intake B1 Cam sensors P0335, P0336, Crank sensors P0016, P0017, P0018, P0019 Cam to crank rationality Engine is running VVT is enabled Desired camshaft position > 0 Power Take Off (PTO) not active	System Voltage > 11 Volts, and System Voltage < 32 Volts Both Desired & Measured cam positions cannot be < KtPHSD_phi_CamPos ErrorLimIc1 or > than (25.0 - KtPHSD_phi_CamPos ErrorLimIc1). Desired cam position cannot vary more than 3.0 Cam Deg for at least KtPHSD_t_StablePositi onTimeIc1 seconds (see Supporting Tables)	135 failures out of 150 samples 100 ms /sample	Type B 2 trips
Exhaust Camshaft Actuator Solenoid Circuit – Bank 1	P0013	Detects a VVT system error by monitoring the circuit for electrical integrity	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		System supply voltage is within limits Output driver is commanded on, Ignition switch is in crank or run position	> 11 Volts, and < 32 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Exhaust Camshaft System Performance – Bank 1	P0014	Detects a VVT system error by comparing the desired and actual cam positions when VVT is activated	Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive	(Exhaust cam Bank 1)Cam Position Error > KtPHSD_phi_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: Time since last execution of diagnostic	 P0335, P0336 P0340, P0341 5VoltReferenceA_FA 5VoltReferenceB_FA < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. There is a delay after the first failed test to allow the camshaft position to return to the park position. This time is defined by the table "Cam Correlation Oil Temperature Threshold".	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							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
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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
HO2S Heater Resistance Bank 1 Sensor 1	P0053	Detects an oxygen sensor heater having an incorrect or out of range resistance value.	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 < 3.6 ohms -OR- Calculated Heater Resistance > 10.3 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	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			Continuous in MAIN processor	

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

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 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
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
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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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:	>= 400 RPM <= 6600 RPM >= 70 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 EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA ECT_Sensor_Ckt_FP IAT_SensorFA IAT_SensorCircuitFP	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.
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) No Active DTCs:	>= 400 RPM <= 6600 RPM >= 70 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 Weight Factor based on RPM See table "IFRD Residual Weighting Factors". MAP_SensorCircuitFA	Continuous Calculations are performed every 12.5 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			<u>Engine Not Rotating Case:</u> Manifold Pressure OR Manifold Pressure	 < 50.0 kPa > 105.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	EGRValve_FP EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA ECT_Sensor_Ckt_FP IAT_SensorFA IAT_SensorCircuitFP > 10.0 seconds EngModeNotRunTmErr MAP_SensorFA AAP_SnsrFA_NA MAP_SensorCircuitFP AAP_SnsrCktFP_NA	999 failures out of 5 samples 1 sample every 12.5 msec	
Manifold Absolute Pressure Sensor Circuit Low	P0107	Detects a continuous short to low or open in either the signal circuit or the MAP sensor.	MAP Voltage	< 3.0 % of 5 Volt Range (0.2 Volts = 3.5 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type B 2 trips
Manifold Absolute Pressure Sensor Circuit High	P0108	Detects an open sensor ground or continuous short to high in either the signal circuit or the MAP sensor.	MAP Voltage	> 90.0 % of 5 Volt Range (4.5 Volts = 115.0 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.
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.	> 10 DegC	Continuous		20 failures out of 200 samples 1 sample every 100 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Engine Coolant Temperature (ECT) Sensor Performance	P0116	This DTC detects ECT temp sensor stuck in mid range.	A failure will be reported if any of the following occur: 1) ECT at power up > IAT at power up by an IAT based table lookup value after a minimum 25200 second soak (fast fail). 2) ECT at power up > IAT at power up by 15.8 C after a minimum 25200 second soak and a block heater has not been detected. 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	See "P0116: Fail if power up ECT exceeds IAT by these values" in the Supporting tables section = False	No Active DTC's Non-volatile memory initization Test complete this trip Test aborted this trip IAT LowFuelCondition Diag **Block Heater detection is enabled when either of the following occurs:** 1) ECT at power up > IAT at power up by 2) Cranking time **Block Heater is detected and diagnostic is aborted when 1)or 2) occurs. Diagnostic is aborted when 3) or 4) occurs:** 1a) Vehicle drive time 1b) Vehicle speed 1c) Additional Vehicle drive time	VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA IgnitionOffTimeValid TimeSinceEngineRunningValid = Not occurred = False = False ≥ -7 ºC = False > 15.8 ºC < 10.0 Seconds > 400 Seconds with > 14.9 MPH	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.
					is provided to 1a when Vehicle speed is below 1b as follows: 1d) IAT drops from power up IAT	0.50 times the seconds with vehicle speed below 1b ≥ 5.3 ºC		
					2a) ECT drops from power up ECT 2b) Engine run time	> 5 ºC Within > 60 Seconds		
					3) Engine run time with vehicle speed below 1b 4) Minimum IAT during test	> 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
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)	>= 400 RPM <= 6600 RPM > 70 Deg C < 125 Deg C > -20 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.
						>= 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 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		
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	79/159 counts; 57 counts continuous; 3.125 msec /count in the ECM main processor	Type: A MIL:

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						No P06A3		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 Temperature	P0128	This DTC detects if the engine coolant temperature rises too slowly due to an ECT or Cooling system fault	Actual accumulated airflow is > predicted accumulated airflow before: 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.	See "P0128: Maximum Accumulated Airflow for IAT and Start-up ECT conditions" in the Supporting tables section	No Active DTC's Engine not run time Engine run time Fuel Condition **Range #1 (Primary) Test** ECT at start run	MAP_SensorFA MAF_SensorFA TPS_Performance_FA TPS_FA TPS_ThrottleAuthority Defaulted IAT_SensorFA ECT_Sensor_Ckt_FA ECT_Sensor_Perf_FA VehicleSpeedSensor_FA ≥ 1800 seconds ≥ 30 seconds Ethanol ≤ 87% ≤ 66.0 °C	30 failures to set DTC 1 sec/sample Once per ignition key cycle	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Average Airflow Vehicle speed	≥ 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 5) With Hybrid Engine Off Active accumulated Airflow is reduced by	 30.0 gps < 2.0 gps 50.00% 1.00 times 1.00 grams each second		
					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	380 failures out of 475 samples	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA	Frequency: Continuous in 100 milli - second loop	
					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		
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2S Circuit High Voltage Bank 1 Sensor 1	P0132	This DTC determines if the O2 sensor circuit is shorted to high.	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 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Equivalence Ratio Air Per Cylinder Fuel Control State **All of the above met for** Time	0.9912 ≤ equiv. ratio ≤ 1.0137 50 ≤ APC ≤ 500 mgrams not = Power Enrichment > 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 MAP_SensorFA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault_No Snsr MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA	Sample time is 60 seconds Frequency: Once per trip Green Sensor Delay Criteria The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
						FuelTankPressureSnsr Ckt_FA		
						FuelInjectorCircuit_FA		
						AIR System FA		
						EthanolCompositionSe nsor_FA		
						EngineMisfireDetected _FA		
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time since Purge On to Off change	> 0.0 seconds		
					Time since Purge Off to On change	> 1.5 seconds		
					Purge duty cycle	>= 0 % duty cycle		
					Engine airflow	14 gps <= engine airflow <= 40 gps		
					Engine speed	1000 <= RPM <= 3500		
					Fuel	< 87 % Ethanol		
					Baro	> 70 kpa		
					Air Per Cylinder	>= 200 mGrams		
					Low Fuel Condition Diag	= False		
					Fuel Control State	= Closed Loop		
					Closed Loop Active	= TRUE		
					LTM fuel cell	= Enabled		
					Transient Fuel Mass	<= 100.0 mgrams		
					Baro	= Not Defaulted		
					Fuel Control State	not = Power Enrichment		
					Fuel State	DFCO not active		
					Commanded Proportional Gain	>= 0.0 %		
					All of the above met for Time	> 3.0 seconds		
O2S Circuit Insufficient Activity Bank 1 Sensor 1	P0134	This DTC determines if the O2 sensor circuit is open.	Measure Oxygen Sensor Signal.	1700 mvolts < Oxygen Sensor signal	No Active DTC's	TPS_ThrottleAuthority Defaulted MAF_SensorFA EthanolCompositionSensor_FA	200 failures out of 250 samples. Frequency: Continuous	2 trips Type B
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					AFM Status	= All Cylinders active	100msec loop	
					Heater Warm-up delay	= Complete		
					Engine Run Time	> 5 seconds		
					Engine Run Accum	> 150 seconds		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Fuel	<= 87 % Ethanol		
O2S Heater Performance Bank 1 Sensor 1	P0135	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	Measured Heater Current.	Measured Heater current < 0.3 amps -OR- Measured Heater current > 2.5 amps	No Active DTC's 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
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	430 failures out of 540 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.
						FuelTankPressureSnsrCkt_FA		
						FuelInjectorCircuit_FA		
					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		
					Fuel Control State	= Closed Loop		
					Closed Loop Active	= TRUE		
					All Fuel Injectors for active Cylinders	Enabled (On)		
					Fuel Condition	Ethanol <= 87%		
					Fuel State	DFCO not active		
					All of the above met for Time	> 5.0 seconds		
O2S Circuit High Voltage Bank 1 Sensor 2	P0138	This DTC determines if the O2 sensor circuit is shorted to high.	Measure Oxygen Sensor Signal.	Oxygen Sensor signal is > 1050 mvolts	**Open Test Criteria**		100 failures out of 125 samples	2 trips Type B
					No Active DTC's	TPS_ThrottleAuthority Defaulted		
						MAF_SensorFA		
						EthanolCompositionSensor_FA	Frequency: Continuous in 100 milli - second loop	
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					AFM Status	= All Cylinders active		
					Heater Warm-up delay	= Complete		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Run Time Engine Run Accum Fuel Condition	> 5 seconds > 150 seconds <= 87 % Ethanol		
					No Active DTC's	MAP_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA		
					Low Fuel Condition Diag	= False		
					Fuel Condition Initial delay after Open Test Criteria met (cold start condition)	<= 87 % Ethanol > 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 Air Per Cylinder Fuel Control State	0.9912 ≤ equiv. ratio ≤ 1.0137 50 ≤ APC ≤ 500 mgrams not = Power Enrichment		
					All of the above met for Time	 > 5 seconds		
O2 Sensor Slow Response Rich to Lean Bank 1 Sensor 2	P013A	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Rich to Lean voltages range during Rich to Lean transition. The diagnostic	The EWMA of the Post O2 sensor normalized integral value is greater than the threshold. OR	1) B1S2 EWMA normalized integral value > 8.0 units OR	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc=	1 trips Type A EWMA

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		is an intrusive test which runs in a DFCO mode to achieve the required response.	The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds) is greater than the airflow threshold.	2) Accumulated air flow during slow rich to lean test > 74 grams (upper threshold is 450 mvolts and lower threshold is 150 mvolts)		IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed	
					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		
					ICAT MAT Burnoff delay	= Not Valid	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on	
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Post fuel cell DTC's Passed DTC's Passed	= enabled = P2270 (and P2272 (if applicable)) = P013E (and P014A (if applicable))	the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).			
O2 Sensor Slow Response Lean to Rich Bank 1 Sensor 2	P013B	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Lean to Rich voltages range during Lean to Rich transition. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	The EWMA of the Post O2 sensor normalized integral value is greater than the threshold. OR The Accumulated mass air flow monitored during the Slow Response Test (between the lower and upper voltage thresholds) is greater than the airflow threshold.	1) B1S2 EWMA normalized integral value > 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	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = TRUE, multiple tests per trip are allowed	1 trips Type A EWMA

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						EngineMisfireDetected_FA		
						EthanolCompositionSensor_FA		
					B1S2 Failed this key cycle	P013A, P013E, P013F, P2270 or P2271		
						10.0 volts < system voltage< 32.0 volts		
					System Voltage			
							Green Sensor Delay Criteria	
					Learned heater resistance	= Valid		
							The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					ICAT MAT Burnoff delay	= Not Valid		
					Green O2S Condition			
						= Not Valid		
					Low Fuel Condition Diag	= False		
					Post fuel cell	= enabled		
					DTC's Passed			
						= P2270 (and P2272 (if applicable))		
					DTC's Passed			
						= P013E (and P014A (if applicable))		
					DTC's Passed			
						= P013A (and P013C (if applicable))		
					DTC's Passed			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					DTC's Passed	= P2271 (and P2273 (if applicable)) = 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 > 33 grams.	No Active DTC's B1S2 Failed this key cycle System Voltage	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, P013F, P2270 or P2271 10.0 volts < system voltage< 32.0 volts	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.
					Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell DTC's Passed	= 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	
					After above conditions are met: DFCO mode entered (wo driver initiated pedal input).			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2 Sensor Delayed Response Lean to Rich Bank 1 Sensor 2	P013F	This DTC determines if the post catalyst O2 sensor has an initial delayed response to an A/F change from Lean to Rich. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	Post O2 sensor cannot go above the threshold voltage. AND The Accumulated mass air flow monitored during the Delayed Response Test is greater than the threshold.	1) Post O2S signal < 300 mvolts AND 2) Accumulated air flow during lean to rich test > 110 grams.	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	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, P2270 or P2271 10.0 volts < system voltage< 32.0 volts = Valid = Not Valid = Not Valid = False = enabled	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed 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	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					DTC's Passed DTC's Passed DTC's Passed DTC's Passed	= P2270 (and P2272 (if applicable)) = P013E (and P014A (if applicable)) = P013A (and P013C (if applicable)) = P2271 (and P2273 (if applicable))	must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					After above conditions are met: Fuel Enrich mode 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 System Voltage AFM Status Heater Warm-up delay Engine Run Time	TPS_ThrottleAuthority Defaulted MAF_SensorFA EthanolCompositionSensor_FA 10.0 volts < system voltage< 32.0 volts = All Cylinders active = Complete > 5 seconds	200 failures out of 250 samples. Frequency: Continuous 100msec loop	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Run Accum Fuel	> 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	400 <rpm< 6600 > 70 kPa -38 <°C< 130 15 <kPa< 255 -20 <°C< 150 1.0 <g/s< 512.0	Frequency: 100 ms Continuous Loop Development data indicates that the Fuel Adjustment System Diagnostic (FASD) is typically enabled during **71.2** % of the EPAIII drive cycle. This is also typical	2 Trip(s) Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Fuel Level	> 10 % or if fuel sender is faulty	of real-world driving, however values will vary (higher or lower) based on the actual conditions present during the drive cycle.	
					Long Term Fuel Trim data accumulation:	> 44.0 seconds of data must accumulate on each trip, with at least 14.0 seconds of data in the current fuel trim cell before a pass or fail decision can be made.		
					fuel trim diagnosed during decels? No			
					Long-Term Fuel Trim Cell Usage			
					Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control or diagnosis. **Please see "Supporting Tables" Tab for a list of cells utilized for diagnosis.**			
					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)		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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 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	<= 0.800 (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	2 Trip(s) Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							71.2 % of the EPAIII drive cycle. This is also typical of real-world driving, however values will vary (higher or lower) based on the actual conditions present during the drive cycle.	
			Intrusive Test:					
			The filtered Purge Long Term Fuel Trim metric	<= 0.810				
			AND					
			The filtered Non-Purge Long Term Fuel Trim metric	<= 0.800 for 2 out of 3 intrusive segments				
		Intrusive Test: When the filtered Purge Long Term Fuel Trim metric is <= 0.810, 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 > 0.810, 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, indicating that the canister has been purged.					

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
SIDI High Pressure Sensor Performance	P0191	This DTC detects a skewed fuel rail sensor via a comparison of measured pressure and commanded/modeled pressure				Enabled when a code clear is not active or not exiting device control Engine is not cranking		1 trips Type A
			Idle test (Low Side Fuel Pressure - High Side Fuel Pressure)	Disabled ≤ -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 1000 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 >= 27.96 MPH 11 <= Volts <= 32 ≥ 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	High Drive Test >= 160 counts (12.5ms per count)	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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 >= 27.96 MPH 11 <= Volts <= 32 ≥ 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	LoDrive Test >= 240 counts (12.5ms per count)	
			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)	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						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)		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active Fuel InjCkt Not (FA or TFTKO) EST Driver Not(FA) Misfire detected Not(FA) MAFR sensor Not(FA) MAPR sensor Not(FA) APSR Pedal sensor Not(FA) TPSR sensor Not(FA) VSPR speed sensor Not(FA) SystemRPM Not (FA) Manual Clutch not engaged or vehicle has automatic transmission All cylinder are fuel enabled		
High Pressure Sensor Out of Range Low	P0192	This DTC checks the circuit for electrical integrity during operation.	High Pressure Fuel Sensor	≤ 5 % of 5Vref	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	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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
								Trips: 1
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

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 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
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	**(>**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	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	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.
			Misfire Percent Catalyst Damage Engine Speed Engine Load Misfire counts (at low speed/loads, one cylinder may not cause cat damage)	>"Catalyst Damaging Misfire Percentage" Table: **Unless** ≤ 1000 rpm AND ≤ 20% load AND ≥ 180 counts on one cylinder			outside 1 FT ; Continuous	
					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	4 cycle delay	
						EnginePowerLimited		
						MAF_SensorTFTKO		
						MAP_SensorTFTKO		
						IAT_SensorTFTKO		
						ECT_Sensor_Ckt_TFTKO		
						5VoltReferenceB_FA		
						CrankSensorTestFailedTKO		
						CrankSensorFaultActive		
						CrankIntakeCamCorrelationFA		
						CrankExhaustCamCorrelationFA		
						CrankCamCorrelationTFTKO		
						AnyCamPhaser_FA		
						AnyCamPhaser_TFTKO		
					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 Throttle Position AND Automatic transmission shift	Clutch shift > 200.00%	4 cycle delay 0 cycle delay	
					Driveline Ring Filter active After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.			
					Filter Driveline ring: Stop filter early:	 7 engine cycles after misfire 3 Engine cycles after misfire		
					Abnormal engine speed oscillations: (Rough road etc) Off Idle, number of consecutive decelerating cylinders after accelerating,: (Number of decels can vary with misfire detection equation) TPS Engine Speed Veh Speed SCD Cyl Mode Rev Mode	 > 3 % > 1000 rpm > 5 kph = 4 consecutive cyls = 2 consecutive cyls = 2 consecutive cyls		

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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Speed	≥ 400 RPM and ≤ 8500 RPM		
					Engine Air Flow	≥ 40 mg/cylinder and ≤ 2000 mg/cylinder	Weight Coefficient = 0.0100	
					ECT	≥ -40 deg's C		
					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) VaKNKD_k_PerfKnockIntFilt	> 0.3000	Engine Speed	≥ 400 RPM	Weight Coefficient = 0.0100	
			Filtered FFT Intensity: (for Abnormal Noise) VaKNKD_k_PerfAbnFiltIntnsity	< Abnormal Noise Threshold (see supporting tables)	Engine Speed	≥ 2000 RPM	Weight Coefficient = 0.0025	
							Updated each engine event	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							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 100 msec rate	Type: B MIL: YES Trips: 2
					Engine Speed	> 400 RPM and < 8500 RPM		
			or					
			Sensor Return Signal Line	< 0.40 Volts				
Knock Sensor (KS) Circuit High Bank 1	P0328	This diagnostic checks for an out of range high knock sensor signal	Sensor Input Signal Line	> 2.76 Volts	Diagnostic Enabled (1 = Enabled)	= 1	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2
					Engine Speed	> 400 RPM and < 8500 RPM		
			or					
			Sensor Return Signal Line	> 1.95 Volts				
Crankshaft Position (CKP) Sensor A Circuit	P0335	Determines if a fault exists with the crank position sensor signal	Engine-Cranking Crankshaft Test: Time since last crankshaft position sensor pulse received	>= 4.0 seconds	Engine-Cranking Crankshaft Test: 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))	Engine-Cranking Crankshaft Test: 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 Crankshaft Test: No crankshaft pulses received Event-Based Crankshaft Test: No crankshaft pulses received	>= 1.0 seconds	Time-Based Crankshaft Test: Engine is Running Starter is not engaged No DTC Active: Event-Based Crankshaft Test: Engine is Running OR Starter is engaged No DTC Active:	5VoltReferenceB_FA 5VoltReferenceA_FA 5VoltReferenceB_FA P0365 P0366	Time-Based Crankshaft Test: Continuous every 12.5 msec Event-Based Crankshaft Test: 2 failures out of 10 samples One sample per engine revolution	
Crankshaft Position (CKP) Sensor A Performance	P0336	Determines if a performance fault exists with the crank position sensor signal	Time in which 20 or more crank re-synchronizations occur Time-Based Crankshaft Test: No crankshaft synchronization gap found Engine Start Test during Crank: Time since starter engaged without detecting crankshaft synchronization gap	< 25.0 seconds >= 0.4 seconds >= 1.5 seconds	Cam-based engine speed No DTC Active: Time-Based Crankshaft Test: Engine is Running Starter is not engaged No DTC Active: Engine Start Test during Crank: Starter engaged AND (cam pulses being received	> 450 RPM 5VoltReferenceB_FA P0335 5VoltReferenceB_FA	Continuous every 250 msec Time-Based Crankshaft Test: Continuous every 12.5 msec Engine Start Test during Crank: Continuous every 100 msec	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	 = FALSE = FALSE = FALSE > 3.0 grams/second))		
			Event-Based Crankshaft Test: Crank Pulses received in one engine revolution OR Crank Pulses received in one engine revolution	 < 51 > 65	Event-Based Crankshaft Test: Engine is Running OR Starter is engaged No DTC Active:	 5VoltReferenceA_FA 5VoltReferenceB_FA P0365 P0366	Event-Based Crankshaft Test: 8 failures out of 10 samples One sample per engine revolution	
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor A	P0340	Determines if a fault exists with the cam position bank 1 sensor A signal	Engine Cranking Camshaft Test: Time since last camshaft position sensor pulse received OR Time that starter has been engaged without a camshaft sensor pulse Time-Based Camshaft Test: Fewer than 4 camshaft pulses received in a time Fast Event-Based Camshaft Test: No camshaft pulses received	 >= 5.5 seconds >= 4.0 seconds > 3.0 seconds	Engine Cranking Camshaft Test: Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow Time-Based Camshaft Test: Engine is Running Starter is not engaged No DTC Active: Fast Event-Based Camshaft Test: Crankshaft is synchronized	 = FALSE = FALSE = FALSE > 3.0 grams/second)) 5VoltReferenceA_FA 	Engine Cranking Camshaft Test: Continuous every 100 msec Time-Based Camshaft Test: Continuous every 100 msec Fast Event-Based Camshaft Test: Continuous every	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			during first 12 MEDRES events (There are 12 MEDRES events per engine cycle)		Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged		MEDRES event	
					No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA		
			<u>Slow Event-Based Camshaft Test:</u> The number of camshaft pulses received during 100 engine cycles		<u>Slow Event-Based Camshaft Test:</u> Crankshaft is synchronized		<u>Slow Event-Based Camshaft Test:</u> 8 failures out of 10 samples	
					No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA		
				= 0			Continuous every engine cycle	
Camshaft Position (CMP) Sensor Performance Bank 1 Sensor A	P0341	Determines if a performance fault exists with the cam position bank 1 sensor A signal	<u>Fast Event-Based Camshaft Test:</u> The number of camshaft pulses received during first 12 MEDRES events is less than 4 or greater than 10 (There are 12 MEDRES events per engine cycle)		<u>Fast Event-Based Camshaft Test:</u> Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged		<u>Fast Event-Based Camshaft Test:</u> Continuous every MEDRES event	Type B 2 trips
					No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA		
			<u>Slow Event-Based Camshaft Test:</u> The number of camshaft pulses		<u>Slow Event-Based Camshaft Test:</u> Crankshaft is synchronized		<u>Slow Event-Based Camshaft Test:</u> 8 failures out of 10	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			received during 100 engine cycles OR	< 398 > 402	No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	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
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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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	Engine Cranking Camshaft Test: Time since last camshaft position sensor pulse received OR Time that starter has been engaged without a camshaft sensor pulse Time-Based Camshaft Test: Fewer than 4 camshaft pulses received in a time Fast Event-Based Camshaft Test: No camshaft pulses received during first 12 MEDRES events (There are 12 MEDRES events per engine cycle)	>= 5.5 seconds >= 4.0 seconds > 3.0 seconds	Engine Cranking Camshaft Test: Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow Time-Based Camshaft Test: Engine is Running Starter is not engaged No DTC Active: 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:	= FALSE = FALSE = FALSE > 3.0 grams/second)) 5VoltReferenceA_FA 5VoltReferenceA_FA	Engine Cranking Camshaft Test: Continuous every 100 msec Time-Based Camshaft Test: Continuous every 100 msec 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.
						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 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 per engine cycle) Slow Event-Based Camshaft Test: The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	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: Slow Event-Based Camshaft Test: Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA 5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor_FA	Fast Event-Based Camshaft Test: Continuous every MEDRES event Slow Event-Based Camshaft Test: 8 failures out of 10 samples Continuous every engine cycle	Type B 2 trips

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: 1000ms	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*		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine speed	> 1200 RPM for a minimum of 30 seconds since end of last idle period.		
					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*		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Predicted catalyst temp > 600 degC AND Engine Airflow > MinAirflowToWarmCatalyst table (g/s) (refer to "Supporting Tables" tab) (Based on engine coolant at the time the WarmedUpEvents counter resets to 0.) for at least 40 seconds with a closed throttle time < 120 seconds consecutively (closed throttle consideration involves having the driver off the accel pedal as stated in the Valid Idle Period Criteria Section) . Also, in order to increment the WarmedUpEvents counter (counter must exceed 40 cal value), either the vehicle speed must exceed the vehicle speed cal or the driver must NOT be off the accel pedal as stated in the Valid Idle Period Criteria section above.			
					Closed loop fueling Enabled **Please see "Closed Loop Enable Criteria" section of the "Supporting Tables" tab for details.**			
					PRNDL is in Drive Range on an Auto Transmission vehicle.			
					Idle Stable Criteria :: Must hold true from after Catalyst Idle Conditions Met to the end of test			
					MAF	*2.50 < g/s < 11.00*		
					Predicted catalyst temperature	< 900 degC		
					Engine Fueling Criteria at Beginning of Idle Period			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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 > 0.770 and the current OSC Normalized Ratio value is < 0.260			
					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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					O2S_Bank_1_Sensor_1_FA			
					O2S_Bank_1_Sensor_2_FA			
					O2S_Bank_2_Sensor_1_FA			
					O2S_Bank_2_Sensor_2_FA			
					FuelTrimSystemB1_FA			
					FuelTrimSystemB1_TFTKO			
					FuelTrimSystemB2_FA			
					FuelTrimSystemB2_TFTKO			
					EngineMisfireDetected_FA			
					EvapPurgeSolenoidCircuit_FA			
					IAC_SystemRPM_FA			
					EGRValvePerformance_FA			
					EGRValveCircuit_FA			
					CamSensorAnyLocationFA			
					CrankSensor_FA			
					TPS_Performance_FA			
					EnginePowerLimited			
					VehicleSpeedSensor_FA			
					AmbientAirDefault_NoSnsr			
Evaporative Emission (EVAP) System Small Leak Detected	P0442	This DTC will detect a small leak (≥ 0.020") in the EVAP system between the fuel fill cap and the purge solenoid. The engine off natural vacuum method (EONV) is used. EONV is an evaporative system leak detection diagnostic that runs when the vehicle is shut off when enable conditions are met. Prior to sealing the system and performing the diagnostic, the fuel volatility is analyzed. In an open system (Canister Vent Solenoid [CVS] open) high volatility fuel creates enough flow to generate a measurable pressure differential relative to atmospheric.	The total delta from peak pressure to peak vacuum during the test is normalized against a calibration pressure threshold table that is based upon fuel level and ambient temperature. (See P0442: EONV Pressure Threshold Table on Supporting Tables Tab). The normalized value is calculated by the following equation: 1 - (peak pressure - peak vacuum) / pressure threshold. The normalized value is entered into EWMA (with 0= perfect pass and 1= perfect fail).		Fuel Level Drive Time Drive length ECT Baro Odometer Engine not run time before key off must be Time since last complete test if normalized result and EWMA is passing	10 % ≤ Percent ≤ 90 % ≥ 600 seconds ≥ 3.1 miles ≥ 70 °C ≥ 70 kPa ≥ 10.0 miles ≤ refer to "P0442: Engine Off Time Before Vehicle Off Maximum as a Function of Estimated Ambient Temperature table" in Supporting Tables. ≥ 17 hours	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.
					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	> 0.59 (EWMA Fail Threshold)	**Conditions for Estimate of Ambient Air Temperature to be valid:**			
			, the DTC light is illuminated.					
		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	The DTC light can be turned off if the EWMA is	≤ 0.35 (EWMA Re-Pass Threshold)	**1. Cold Start** Startup delta deg C (ECT-IAT)	≤ 8 °C		
					OR **2. Short Soak and Previous EAT Valid**			
			and stays below the EWMA fail threshold for 2 additional consecutive trips.		Previous time since engine off	≤ 7200 seconds		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		vacuum will continue until it reaches a vacuum peak. When the pressure rises 62.27 Pa from vacuum peak, the test then completes. If the key is turned on while the diagnostic test is in progress, the test will abort.			OR **3. Less than a short soak and Previous EAT Not Valid** Previous time since engine off AND Must expire Estimate of Ambient Temperature Valid Conditioning Time. **"P0442: Estimate of Ambient Temperature Valid Conditioning Time" in Supporting Tables Tab.** OR **4. Not a Cold Start and greater than a Short Soak**	≤ 7200 seconds Vehicle Speed ≥ 19.9 mph AND Mass Air Flow ≥ 6 g/sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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	< -5		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					then test aborts and unsuccessful attempts is incremented. OR **2. Vacuum Refueling Detected** See P0454 Fault Code for information on vacuum refueling algorithm. OR **3. Fuel Level Refueling Detected** See P0464 Fault Code for information on fuel level refueling. OR **4. Vacuum Out of Range and No Refueling** See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for information on fuel level refueling.			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					OR **5. Vacuum Out of Range and Refueling Detected** See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for information on fuel level refueling. OR **6. Vent Valve Override Failed** Device control using an off-board tool to control the vent solenoid, cannot exceed during the EONV test	0.50 seconds		
					OR **7. Key up during EONV test**			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No active DTCs:	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 solenoid operation	2 trips Type B
Evaporative Emission (EVAP) Vent System Performance	P0446	This DTC will determine if a restriction is present in the vent solenoid, vent filler, vent hose or EVAP canister. This test runs with normal purge and vent valve is open.	Vent Restriction Prep Test: Vented Vacuum OR Vented Vacuum	 < -623 Pa > 1245 Pa	Fuel Level System Voltage Startup IAT Startup ECT BARO	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C ≥ 70 kPa	Once per Cold Start Time is dependent on driving	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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.	 > 2989 Pa ≥ 10 liters	No active DTCs:	MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorCircuitFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454	conditions Maximum time before test abort is 1000 seconds	
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
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)		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.	1 trip Type A EWMA Average run length: 6

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Upper voltage threshold (voltage addition above the nominal voltage)	0.2 volts				
			Lower voltage threshold (voltage subtraction below the nominal voltage)	0.2 volts				Run length is 2 trips after code clear or non-volatile reset
			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).				The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.	
			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.	> 0.73 (EWMA Fail Threshold) ≤ 0.40 (EWMA Re-Pass Threshold)				
Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage	P0452	This DTC will detect a fuel tank pressure sensor signal that is too low out of range.	Fuel tank pressure sensor signal	< 0.15 volts (3 % of Vref or ~ 1681 Pa)	Time delay after sensor power up for sensor warm-up		80 failures out of 100 samples	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			The normal operating range of the fuel tank pressure sensor is 0.5 volts (~1245 Pa) to 4.5 volts (~ -3736 Pa).		ECM State ≠ crank Stops 6.0 seconds after key-off	is 0.10 seconds	100 ms / sample Continuous	
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.		This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			An abrupt change is defined as a change in vacuum: in the span of 1.0 seconds. But in 12.5 msec. A refueling event is confirmed if the fuel level has a persistent change for 30 seconds.	>112 Pa < 249 Pa of 10 %			The test will report a failure if 2 out of 3 samples are failures. 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>	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	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	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					If ECT > IAT, Startup temperature delta (ECT-IAT): Cold Test Timer Startup IAT Temperature Startup ECT Weak Vacuum Follow-up Test This test can run following a weak vacuum failure or on a hot restart.	≤ 8 °C ≤ 1000 seconds 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C	detected, the follow-up test is limited to 1300 seconds. Once the MIL is on, the follow-up test runs indefinitely.	
Fuel Level Sensor 1 Performance	P0461	This DTC will detect a fuel sender stuck in range in the primary fuel tank.	Delta Fuel Volume change over an accumulated 155 miles.	< 3 liters	Engine Running No active DTCs:	VehicleSpeedSensor_FA	250 ms / sample Continuous	2 trips Type B
Fuel Level Sensor 1 Circuit Low Voltage	P0462	This DTC will detect a fuel sender stuck out of range low in the primary fuel tank.	Fuel level Sender % of 5V range	< 10 %	Run/Crank Voltage Run/Crank voltage goes to 0 volts at key off	11 volts ≤ Voltage ≤ 32 volts	180 failures out of 225 samples 100 ms / sample Continuous	2 trips Type B
Fuel Level Sensor 1 Circuit High Voltage	P0463	This DTC will detect a fuel sender stuck out ofrange high in the primary fuel tank.	Fuel level Sender % of 5V range	> 60 %	Run/Crank Voltage Run/Crank voltage goes to 0 volts at key off	11 volts ≤ Voltage ≤ 32 volts	180 failures out of 225 samples 100 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.
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.		This test will execute whenever the engine-off natural vacuum small leak test (P0442) executes		This test is executed during an engine-off natural vacuum small leak test. The test can only execute up to once per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.	1 trips Type A
			An intermintant change in fuel level is defined as:				The test will report a failure if 2 out of 3 samples are failures.	
			The fuel level changes	by 10 %				
			and does not remain	> 10 %				
			for 30 seconds during a 600 second refueling rationality test.				100 ms / sample	
Cooling Fan 1 Relay Control Circuit (ODM)	P0480	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples	2 trips Type B
					Engine Speed	≥ 400 RPM	25 ms / sample	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							Continuous with fan operation	
Cooling Fan 2 Relay Control Circuit (ODM)	P0481	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 400 RPM	20 failures out of 25 samples 25 ms / sample Continuous with fan operation	2 trips Type B
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_F 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 > 10 sec PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active. 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	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.
						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 > 10 sec PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active.	Diagnostic runs in every 12.5 ms loop Diagnostic reports pass or fail in 10 sec once all enable conds are met	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimit AND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion)		
					No active DTCs	AmbientAirDefault ECT_Sensor_FA EngCoolHot EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA EnginePowerLimited TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFault LowFuelConditionDiagnostic ClchPstnEmisFA ClchToT_TypedABC		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Cold Start Rough Idle	P050D	Monitors the combustion performance when the cold start emission reduction strategy is active by accumulating and determining the percentage of engine cycles that have less than complete combustion relative to the total number of engine cycles in which Dual Pulse is active.	Deceleration index vs. Engine Speed Vs Engine load Deceleration index calculation is tailored to specific 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	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	<= 1900.00 RPM		
					Barometric Pressure	>= 60.00 KPa		
					Pedal position	<= 1 Pct		
					For the engine speeds and loads in which Dual Pulse is active:			
					Dual Pulse Error induced misfires percentage	>= catalyst damaging misfire		
					Dual Pulse Error induced misfires percentage	< 90% of the maximum achieveable catalyst damaging misfire.		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Cycles	>= 50		
					Engine Cycles	< 501		
					The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:			
					Catalyst Temperature	>= 1000.00 degC		
					AND			
					Engine Run Time	>= 17.50 seconds		
					OR			
					Engine Run Time	> 17.50 seconds		
					OR			
					Engine Coolant	>= 56.00 degC		
					Dual Pulse Strategy will exit per the following:			
					Engine Speed	> 2000.00 RPM		
					OR			
					Barometric Pressure	< 60.00 Kpa		
					Pedal position	> 2 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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					IAT_SensorCircuitFA IAT2_SensorCircuitFA CrankSensorFaultActive FuelInjectorCircuit_FA MAF_SensorFA MAP_SensorFA AnyCamPhaser_TFTKO Clutch Sensor FA IAC_SystemRPM_FA IgnitionOutputDriver_FA TPS_FA VehicleSpeedSensor_FA TransmissionEngagedState_FA EngineTorqueInaccurate 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	TRUE	fail continuously for greater than 0.500 seconds	Type: C MIL: NO

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
								Trips: 1
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	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	fail continuously for greater than 90.000 seconds 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	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:

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
								A MIL: YES Trips: 1
			2) The Primary Processor's Error Correcting Code hardware in the flash memory detects an error. Covers all software and calibrations.	2) 254 failures detected via Error Correcting Code			2) Diagnostic runs continuously via the flash hardware	
			3) The Primary Processor's calculated checksum does not match the stored checksum value for a selected subset of the calibrations	3) 2 consecutive failures detected or 5 total failures detected.			3) Diagnostic runs continuously. Will report a detected fault within 200 ms.	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							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.	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Secondary Processor Stack Fault		Checks for stack over or underflow in secondary processorby looking for corruption of known pattern at stack boundaries	Checks number of stack over/under flow since last powerup reset >=	5		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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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	
MAIN 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 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_CnvrtrTestEnbld == 1 Value of KePISD_b_A2D_CnvrtrTestEnbld 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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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 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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
VIN Not Programmed or Mismatched - Engine Control Module (ECM)	P0630	This DTC checks 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
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 conditions	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 YES 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 conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in 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.
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 ≥ 2 seconds	2 trips Type B
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on th 5 volt reference circuit #1	ECM Vref3 < or ECM Vref3 >	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 conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
5 Volt Reference #4 Circuit	P06A3	Detects a continuous or intermittent short on th 5 volt reference circuit #2	ECM Vref4 < or ECM Vref4 >	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 conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in 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.
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
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			**All except Class2 PWM:**	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Serial communication to EBTCM (U0108)	No loss of communication	Count of 2's complement values not equal >= 20 Performed every 12.5 msec	
					Power Mode	= Run		
			OR					
			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	Engine Running Status of traction in GMLAN message ($4E9)	= True = 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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Inlet Airflow System Performance	P1101	Determines if there are multiple air induction problems affecting airflow and/or manifold pressure.	Filtered Throttle Model Error AND (ABS(Measured Flow – Modeled Air Flow) Filtered OR ABS(Measured MAP – MAP Model 1) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	<= 300 kPa*(g/s) > 17 grams/sec > 25.0 kPa) > 25.0 kPa	Engine Speed Engine Speed Coolant Temp Coolant Temp Intake Air Temp Intake Air Temp Minimum total weight factor (all factors multiplied together) No Active DTCs:	>= 400 RPM <= 6600 RPM > 70 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 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	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		
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	TPS_ThrottleAuthority Defaulted MAP_SensorFA IAT_SensorFA ECT_Sensor_FA AmbientAirDefault_No Snsr MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsr Ckt_FA	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	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						FuelInjectorCircuit_FA	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	
						AIR System FA		
						EthanolCompositionSensor_FA		
						EngineMisfireDetected_FA		
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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	> 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
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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Cold Start Emissions Reduction System Fault	P1400	Model based test computes power from exhaust flow and thermal energy resulting from elevated idle speed and retarded spark advance. Detects if the cold start emission reduction system has failed resulting in the delivered power being out of range.	Average desired accumulated exhaust power - Average estimated accumulated exhaust power OR Average desired accumulated exhaust power - Average estimated accumulated exhaust power	< -32.00 KJ/s (high RPM failure mode) > 4.25 KJ/s (low RPM failure mode)	**To enable the diagnostic, the Cold Start Emission Reduction Strategy must be Active per the following:**		Runs once per trip when the cold start emission reduction strategy is active Frequency: 100ms Loop Test completes after 8 seconds of accumulated qualified data.	Type A 1 Trip(s)
					Catalyst Temperature	< 500.00 degC		
					AND			
					Engine Coolant	> -10.00 degC		
					The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:			
					Catalyst Temperature	>= 1000.00 degC		
					AND			
					Engine Run Time	>= 17.50 seconds		
					OR			
					Engine Run Time	> 17.50 seconds		
					OR			
					Engine Coolant	>= 56.00 degC		
					Other Enable Criteria			
					Vehicle Speed	< 2 kph		
					Driver must be off the accel pedal. This checks that the final accel pedal position (comprehending deadband and hysteresis) is essentially zero.			
					A change in throttle position (tip-in/tip-out) will initiate a delay in the calculation of the average qualified residual value. When the			
					Pedal Close Delay Timer	> 5.00 seconds		
					the diagnostic will continue the calculation.			
					Clutch Pedal Position	< 5.00 pct		
					Clutch Pedal Position	> 5.00 pct		
					Idle Speed Control System	Active		
					General Enable			
					DTC's Not Set			
					GetAPSR_b_PedalFailure			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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 # of Protect Errors # of Alive Rolling Errors No idle diagnostic 506/507 code No Serial communication loss to TCM Engine Running Power mode	0.5 10 6 IAC_SystemRPM_FA (U0101) = TRUE Run Crank Active		
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:

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
								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	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.
					error(P1682) not active			
Ignition Voltage Correlation	P1682	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the Powertrain Relay Ignition Voltage	|Run/Crank – ETC Run/Crank| >	3.00 Volts	Powertrain commanded on and Run/crank voltage > or ETC 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	79.30 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.
			Engine min capacity above threshold	80.30 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	2.79 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 250 RPM		Engine speed greater than 0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			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	9.09 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	2.02 kpa		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.
			Throttle desired torque above desired torque plus threshold	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Desired filtered throttle torque exceeds the threshold plus the higher of desired throttle torque or modeled throttle torque	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque feedback proportional term is out of allowable range or its dual store copy does not match	High Threshold 40.15 Nm Low Threshold -40.15 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time 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 75.28 Nm Low Threshold -80.30 Nm Rate of change threshold 5.02 Nm/loop		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of Final Torque feedback proportional plus integral term and its redundant calculation is out of bounds given by threshold range	High Threshold 80.30 Nm Low Threshold -80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Difference of torque model coefficients and its redundant calculation is out of bounds given by threshold range	High Threshold 0.0001588 Low Threshold -0.0001588		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 80.30Nm Low Threshold -80.30Nm		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 80.30 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time 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 80.30 Nm Low Threshold -80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Generator friction torque is out of bounds given by threshold range	High Threshold 80.30 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Supercharger friction torque is out of bounds given by threshold range	High Threshold 80.30 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Filtered Torque error magnitude or its increase rate of change is out of allowable range or its dual store copy does not match	High Threshold 80.30 Nm Low Threshold -80.30 Nm Rate of change threshold		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 80.30 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Delta Torque Baro compensation is out of bounds given by threshold range	High Threshold 3.84 Nm Low Threshold -2.11 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time 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	1) 79.30 Nm 2) NA 3) 79.30 Nm 4) 79.30 Nm		1&2) Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 80.30 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	10.28 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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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 + 80.30 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	
			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	10.28 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	10.28 degrees		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.
			Estimated Engine Torque and its dual store are not match	80.30 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Estimated Engine Torque without reductions due to torque control and its dual store are not match	80.30 Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of desired spark advance for managed torque and its redundant calculation is out of bounds given by threshold range	10.28 degrees		Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > 80.30 Nm	Up/down timer 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	80.30 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	133.61 mg		Engine speed >0rpm	Up/down timer 148 ms continuous, 0.5 down time multipier	
			One step ahead calculation of air-per-cylinder greater than two step ahead calculation by threshold for time	Threshold: Dynamically calculated based on current engine conditions Fault Pending Threshold: 100 ms		Engine speed > 750rpm	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.
			Rate limited cruise axle torque request and its dual store do not match	148.49 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 3) Absolute difference of Calculated accelerator pedal position and its dual store do not equal	1) 5.00 % 2) NA 3) NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded axle torque is greater than its redundant calculation by threshold	1187.91 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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Commanded engine torque due to fast actuators and its dual store do not equal	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	
			Arbitrated Air-Per-Cylinder filter coefficient is out of bounds given by threshold range	High Threshold 1.000 Low Threshold 0.200		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time 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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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	80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of Accessory torque and its redundant calculation is out of bounds given by threshold range	80.30 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	133.61 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	10.28 degrees		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.
			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	-80.30 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	80.30 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 1187.91 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	
			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	10.28 degrees		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.
			Predicted torque for uncorrected zero pedal determination is greater than calc'ed limit.	Table, f(Engine, Oil Temp). See supporting tables + 80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque request exceeds calculated torque limit	Table, f(Engine, Oil Temp). See supporting tables + 80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	Table, f(Engine, Oil Temp). See supporting tables + 80.30 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Difference between Driver Requested Immediate Torque primary path and its secondary exceeds threshold	1187.91 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 >	9.09 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:
					TPS minimum learn is not active and Throttle is being Controlled and			A
			Difference between modeled throttle position and measured throttle position >	9.09 percent	(Engine Running or Ignition Voltage > or	11		MIL: YES
					Ignition Voltage >) Ignition voltage failure is false (P1682)	5.5		Trips: 1
		2) Detect throttle control is driving the throttle in the incorrect direction or exceed the reduced power limit	Throttle Position >	41.94 percent	TPS minimum learn is active		2. 11counts; 12.5 msec/count in the primary processor	
			Throttle Position >	40.94 percent	Reduced Power is True			
					Powertrain relay voltage	> 6.41 Volts		
Throttle return to default	P2119	Throttle unable to return to default throttle position after de-energizing ETC motor.	TPS1 Voltage >	1.94	Throttle de-energized	Run/Crank voltage or Powertrain relay voltage > 6.41 and reduced power is false, else the failure will be reported for all conditions	0.4969sec	Type:
			AND		No TPs circuit faults			C
			TPS2 Voltage >	1.94		No 5V reference error No 5 V reference DTCs		MIL: NO
								Trips:

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					PT Relay Voltage >	5.5		1
Accelerator Pedal Position (APP) Sensor 1 Lo	P2122	Detect a continuous or intermittent short or open in the APP sensor #1 on Main processor	APP1 Voltage <	0.463		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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
								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
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	1. 19/39counts or 14 counts continuous; 12.5 msec/count in the main processor	Type: A MIL:

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						No P0697		YES Trips: 1
Throttle Position (TP) Sensor 1-2 Correlation	P2135	1. Detects a continuous or intermittent correlation fault between TP sensors #1 and #2 on Main processor	1. Difference between TPS1 displaced and TPS2 displaced >	7.022% offset at min. throttle position with an increasing to 10% at max. throttle position		Run/Crank voltage or Powertrain relay voltage > 6.41 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
		2. Detects a continuous or intermittent correlation fault between TP sensors #1 and #2 on MHC processor	2. Difference between (normalized min TPS1) and (normalized_min TPS2) >	5.000 % of Vref				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138	Detects a continuous or intermittent correlation fault between APP sensors #1 and #2	1. the difference between APP 1 displaced and APP 2 displaced is >	10.001% offset at min. 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: A MIL: YES Trips: 1
			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		
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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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
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	0.88		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.	Bank 1 Filtered Length Ratio variable	> 0.45	System Voltage	*10 <= V <= 32 for >= 4 seconds*	Frequency: Continuous Monitoring of O2 voltage signal in 12.5ms loop	2 Trip(s) Type B
					ECT	> -20 oC		
					Engine speed	*500 <= rpm <= 4300*		
			OR		Mass Airflow	*6.0 <= g/s <= 600.0*		
			Bank 1 AFM (DoD) Filtered Length Ratio variable (AFM applications only)	> 0.01	Air Per Cylinder	*0 <= mg/cylinder <= 2000*		
					% Ethanol	<= 87 %		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		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.			Positive (rising) Delta O2 voltage during previous 12.5ms is OR Negative (falling) Delta O2 voltage during previous 12.5ms is	> 5.0 millivolts	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.	
			AND					
			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.	950 and 50 millivolts	**OR**			
					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	>= 2 times during current 2.50 second sample period		
					Quality Factor	>= 0.95 in the current operating region		
					No EngineMisfireDetected_FA			
					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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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 >= 2.0 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.*		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Data collection is suspended under the following circumstances:	- for 1.0 seconds after AFM transitions - for 2.0 seconds after Closed Loop transitions from Off to On - for 2.0 seconds after purge transitions from Off to On or On to Off - for 2.0 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	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA	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.
						MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA		
					B1S2 Failed this key cycle	P013A, P013B, P013E, P013F, P2270 or P2271		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria	
					ICAT MAT Burnoff delay Green O2S Condition	= Not Valid = Not Valid	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					Low Fuel Condition Diag Engine Speed to initially enable test	= False		
					Engine Speed range to keep test enabled (after initially enabled)	1250 <= RPM <= 2300		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Airflow	1100 <= RPM <= 2450 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 <= 79.5 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		
					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.				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2 Sensor Signal Stuck Rich Bank 1 Sensor 2	P2271	This DTC determines if the post catalyst O2 sensor is stuck in a normal rich voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic is an intrusive test which requests the DFCO mode to achieve the required lean threshold.	Post O2 sensor 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 > 36 grams.	No Active DTC's B1S2 Failed this key cycle	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013A, P013B, P013E, P013F or P2270	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.
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria	
					ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Engine Speed Engine Airflow Vehicle Speed Closed loop integral Closed Loop Active Evap Ethanol Post fuel cell Power Take Off EGR Intrusive diagnostic All post sensor heater delays O2S Heater on Time	= Not Valid = Not Valid = False 1250 <= RPM <= 2300 3 gps <= Airflow <= 12 gps 34.2 mph <= Veh Speed <= 74.6 mph 0.93 <= C/L Int <= 1.07 = TRUE not in control of purge not in estimate mode = enabled = not active = not active = not active >= 120.0 sec	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	

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		
					DTC's Passed	= P2270 (and P2272 (if applicable))		
					DTC's Passed	= P013E (and P014A (if applicable))		
					DTC's Passed	= P013A (and P013C (if applicable))		
					After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).			
SIDI High Pressure Pump	P228C	Detects measured fuel rail pressure bias too low from desired fuel pressure.	Desired Pressure - Measure Pressure	≥ 3.00 Mpa	Battery Voltage	11 <= Volts <= 32	Pressure Error - 750 failures out of 938 samples	1 trips Type A
					Low Pressure Pump	> 0.275 MPa		
					Engine Run Time	>= KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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: 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	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
					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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Transmission Control Torque Request Circuit	P2544	Determines if the torque request from the TCM is valid	**Protect error** - Serial Communication message - ($199 - PTEI3)	Message <> two's complement of message			>= 10 Protect errors during key cycle Performed every 12.5 msec	2 trip(s)
			OR					
			Rolling count error - Serial Communication message ($199 - PPEI3) rolling count value	Message <> previous message rolling count value + one	Diagnostic enabled/disabled	Enabled	>= 6 Rolling count errors out of ten samples Performed every 12.5 msec	Type B
			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	>= 6 RAM errors out of 10 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				>= 3 multi-transitions out of 5 samples Performed every 200 msec	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
				Requested torque intervention type toggles from not increasing request to increasing request				
ECM/PCM Internal Engine Off Timer Performance	P2610	This DTC determines if the engine mode not running timer does not initialize or count properly. There are two tests to ensure proper functioning of the timer: Count Up Test (CUT) and Range Test (RaTe). Count Up Test (CUT): Verifies that the HWIO timer is counting up with the proper increment. Range Test (RaTe): Runs a mirror timer to the HWIO timer. The mirror timer is started when the Engine Mode Not Run Timer is started. When the engine starts or when a controller shutdown is requested, the HWIO timer and mirror timer are compared.	**Count Up Test:** Time difference between the current read and the previous read of the Timer **Range Test:** The variation of the HWIO timer and mirror timer is at controller shutdown.	 > 1.50 seconds > 25 %	IAT Temperature No active DTCs: **Count Up Test:** Ignition key off OR Engine off **Range Test:** ECM is powering down	-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. **Range Test:** One time when the controller is powered down.	2 trips Type B DTC sets on next key cycle if failure detected.

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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Lost Communication With TCM	U0101	This DTC monitors for a loss of communication with the transmission control module	Message is not received from controller for 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 The bus has been on for A message has been selected to monitor.	11 volts ≤ Voltage ≤ 32 volts > 3.0000 seconds	The diagnostic runs in the 1000 ms loop	Type B 2 trips

P0442: EONV Pressure Threshold Table (in Pascals)

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

	0.0000	6.2499	12.4998	18.7497	24.9996	31.2495	37.4994	43.7493	49.9992	56.2491	62.4990	68.7490
-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
-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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

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

	74.9989	81.2488	87.4987	93.7486	99.9985
-10.0000	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
-4.3750	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
1.2500	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
6.8750	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
12.5000	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
18.1250	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
23.7500	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
29.3750	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
35.0000	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
40.6250	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
46.2500	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
51.8750	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
57.5000	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
63.1250	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
68.7500	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
74.3750	-167.6009	-149.6003	-131.8428	-124.5453	-124.5453
80.0000	-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
Curve	44	44	44	44	68	82	105	153	320	480	480	480

Axis	58	63	69	74	80
Curve	480	480	480	480	480

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

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

Axis	Curve
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	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750
	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.509	0.911

6250	6750	7250	9000
0.954	0.000	0.000	0.000

MAF Residual Weight Factor based on RPM

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

6250	6750	7250	9000
0.503	0.000	0.000	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
	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

150.0	200.0	280.0	350.0
1.000	1.000	1.000	1.000

MAP1 Residual Weight Factor based on RPM

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

6250	6750	7250	9000
1.000	0.000	0.000	0.000

MAP2 Residual Weight Factor based on RPM

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

6250	6750	7250	9000
1.000	0.000	0.000	0.000

MAP3 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2700	3100	3200	3300	3500	3700	4000	4200	4500
	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

5000	5250	5500	8000
1.000	1.000	1.000	1.000

TIAP1 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2700	3100	3200	3300	3500	3700	4000	4200	4500
	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

5000	5250	5500	8000
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
	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

5000	5500	6500	8000
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
	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

5000	5500	6500	8000
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
	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

0.81	0.88	0.94	1.00
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

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
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
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	T	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	F	T	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	T	F	P1101
F	F	T	F	T	F	T	T	P1101
F	F	T	F	T	T	F	F	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	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	No DTC
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

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	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	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
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

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	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	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
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

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	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	F	T	T	P0236
T	T	F	F	T	T	F	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	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	F	T	T	T	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

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	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
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 input line (Return).

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 Method

Y-axis: Engine Speed (RPM) \ X-axis: Engine Air Flow (mg per cylinder)	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. <u>20 kHz Method</u>:

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500
OpenCktThrshMin:	2.2637	2.3032	2.2908	2.2327	2.1348	2.0039	1.8464	1.6682	1.4758	1.2756	1.0740

6000	6500	7000	7500	8000	8500
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
OpenCktThrshMax:	5.4063	5.5120	5.4968	5.3755	5.1631	4.8748	4.5254	4.1301	3.7041	3.2622	2.8193

6000	6500	7000	7500	8000	8500
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
OpenCktThrshMin:	0.0000	0.0000	0.0000	0.0000	0.0071	0.0432	0.0664	0.0793	0.0852	0.0869	0.0874

6000	6500	7000	7500	8000	8500
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
OpenCktThrshMax:	0.0500	0.0500	0.0500	0.0500	0.0500	0.0500	0.1401	0.2021	0.2292	0.2361	0.2375

6000	6500	7000	7500	8000	8500
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
OpenTestThreshLo	0.0161	0.0134	0.0193	0.0317	0.0442	0.0781	0.1089	0.1436	0.1816	0.2219	0.2639

6000	6500	7000	7500	8000	8500
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
OpenTestThreshHi	0.0334	0.0349	0.0530	0.0876	0.1301	0.2078	0.3015	0.4019	0.5068	0.6296	0.8064

6000	6500	7000	7500	8000	8500
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
40	75008	15328	15328	11440	75008	75008	75008	75008	75008	75008	75008	75008	75008
80	75008	15328	15328	11440	25008	22784	27600	24784	29952	20992	17152	17152	75008
120	75008	20272	20272	19408	25008	27008	29008	27008	29952	20992	17152	17152	75008
160	75008	27168	27168	29072	27520	29008	30000	28528	30752	21056	20320	20320	75008
200	75008	17568	17568	24832	27008	35008	35008	25280	37328	23104	19232	19232	75008
240	75008	15312	15312	22960	29008	35008	35008	30896	41648	23728	25008	21408	75008
280	75008	27280	27280	22656	25008	35008	35008	32000	44736	27632	36896	36896	75008
320	75008	75008	24816	24816	25728	29008	32000	35008	45008	33008	24976	24976	75008
360	75008	75008	24896	24896	25008	29008	30000	35008	44000	34128	33248	33248	75008
400	75008	75008	27856	27856	24576	28000	25152	32000	40000	30000	33008	30000	75008
440	75008	75008	23920	23920	23536	23264	25888	29008	35600	29008	35408	35408	75008
480	75008	75008	23920	23920	23536	23264	25888	29008	35600	23936	35408	35408	75008
520	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008
560	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008
640	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008
720	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008
800	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008	75008

KtOXYD_cmp_AFIM_LngthThrsh1 (Con't)

AvgFlow / AvgRPM	4000	4500	5000	6000
40	75008	75008	75008	75008
80	75008	75008	75008	75008
120	75008	75008	75008	75008
160	75008	75008	75008	75008
200	75008	75008	75008	75008
240	75008	75008	75008	75008
280	75008	75008	75008	75008
320	75008	75008	75008	75008
360	75008	75008	75008	75008
400	75008	75008	75008	75008
440	75008	75008	75008	75008
480	75008	75008	75008	75008
520	75008	75008	75008	75008
560	75008	75008	75008	75008
640	75008	75008	75008	75008
720	75008	75008	75008	75008
800	75008	75008	75008	75008

KtOXYD_cmp_AFIM_LngthThrsh1_DoD (AFM applications only)

AvgFlow / AvgRPM	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500
40	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
120	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
200	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
280	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
360	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
440	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
520	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
640	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
800	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh1_DoD (AFM applications only) (Con't)

AvgFlow / AvgRPM	4000	4500	5000	6000
40	50000	50000	50000	50000
80	50000	50000	50000	50000
120	50000	50000	50000	50000
160	50000	50000	50000	50000
200	50000	50000	50000	50000
240	50000	50000	50000	50000
280	50000	50000	50000	50000
320	50000	50000	50000	50000
360	50000	50000	50000	50000
400	50000	50000	50000	50000
440	50000	50000	50000	50000
480	50000	50000	50000	50000
520	50000	50000	50000	50000
560	50000	50000	50000	50000
640	50000	50000	50000	50000
720	50000	50000	50000	50000
800	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh2

AvgFlow / AvgRPM	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500
40	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
120	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
200	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
280	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
360	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
440	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
520	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
640	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
800	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh2 (Con't)

AvgFlow / AvgRPM	4000	4500	5000	6000
40	50000	50000	50000	50000
80	50000	50000	50000	50000
120	50000	50000	50000	50000
160	50000	50000	50000	50000
200	50000	50000	50000	50000
240	50000	50000	50000	50000
280	50000	50000	50000	50000
320	50000	50000	50000	50000
360	50000	50000	50000	50000
400	50000	50000	50000	50000
440	50000	50000	50000	50000
480	50000	50000	50000	50000
520	50000	50000	50000	50000
560	50000	50000	50000	50000
640	50000	50000	50000	50000
720	50000	50000	50000	50000
800	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
40	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
120	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
200	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
280	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
360	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
440	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
520	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
640	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
800	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh2_DoD (AFM applications only) (Con't)

AvgFlow / AvgRPM	4000	4500	5000	6000
40	50000	50000	50000	50000
80	50000	50000	50000	50000
120	50000	50000	50000	50000
160	50000	50000	50000	50000
200	50000	50000	50000	50000
240	50000	50000	50000	50000
280	50000	50000	50000	50000
320	50000	50000	50000	50000
360	50000	50000	50000	50000
400	50000	50000	50000	50000
440	50000	50000	50000	50000
480	50000	50000	50000	50000
520	50000	50000	50000	50000
560	50000	50000	50000	50000
640	50000	50000	50000	50000
720	50000	50000	50000	50000
800	50000	50000	50000	50000

KtOXYD_K_AFIM_QualFactor1

AvgFlow / AvgRPM	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500
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
80	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	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
160	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
200	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
240	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
280	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
320	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
360	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
400	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
440	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
480	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
520	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
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
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

KtOXYD_K_AFIM_QualFactor1 (Con't)

AvgFlow / AvgRPM	4000	4500	5000	6000
40	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00
240	0.00	0.00	0.00	0.00
280	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00
360	0.00	0.00	0.00	0.00
400	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00
480	0.00	0.00	0.00	0.00
520	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00
640	0.00	0.00	0.00	0.00
720	0.00	0.00	0.00	0.00
800	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

KtOXYD_K_AFIM_QualFactor1_DoD (AFM applications only) (Con't)

AvgFlow / AvgRPM	4000	4500	5000	6000
40	1.00	1.00	1.00	1.00
80	1.00	1.00	1.00	1.00
120	1.00	1.00	1.00	1.00
160	1.00	1.00	1.00	1.00
200	1.00	1.00	1.00	1.00
240	1.00	1.00	1.00	1.00
280	1.00	1.00	1.00	1.00
320	1.00	1.00	1.00	1.00
360	1.00	1.00	1.00	1.00
400	1.00	1.00	1.00	1.00
440	1.00	1.00	1.00	1.00
480	1.00	1.00	1.00	1.00
520	1.00	1.00	1.00	1.00
560	1.00	1.00	1.00	1.00
640	1.00	1.00	1.00	1.00
720	1.00	1.00	1.00	1.00
800	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

KtOXYD_K_AFIM_QualFactor2 (Con't)

AvgFlow / AvgRPM	4000	4500	5000	6000
40	1.00	1.00	1.00	1.00
80	1.00	1.00	1.00	1.00
120	1.00	1.00	1.00	1.00
160	1.00	1.00	1.00	1.00
200	1.00	1.00	1.00	1.00
240	1.00	1.00	1.00	1.00
280	1.00	1.00	1.00	1.00
320	1.00	1.00	1.00	1.00
360	1.00	1.00	1.00	1.00
400	1.00	1.00	1.00	1.00
440	1.00	1.00	1.00	1.00
480	1.00	1.00	1.00	1.00
520	1.00	1.00	1.00	1.00
560	1.00	1.00	1.00	1.00
640	1.00	1.00	1.00	1.00
720	1.00	1.00	1.00	1.00
800	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

KtOXYD_K_AFIM_QualFactor2_DoD (AFM applications only) (Con't)

AvgFlow / AvgRPM	4000	4500	5000	6000
40	1.00	1.00	1.00	1.00
80	1.00	1.00	1.00	1.00
120	1.00	1.00	1.00	1.00
160	1.00	1.00	1.00	1.00
200	1.00	1.00	1.00	1.00
240	1.00	1.00	1.00	1.00
280	1.00	1.00	1.00	1.00
320	1.00	1.00	1.00	1.00
360	1.00	1.00	1.00	1.00
400	1.00	1.00	1.00	1.00
440	1.00	1.00	1.00	1.00
480	1.00	1.00	1.00	1.00
520	1.00	1.00	1.00	1.00
560	1.00	1.00	1.00	1.00
640	1.00	1.00	1.00	1.00
720	1.00	1.00	1.00	1.00
800	1.00	1.00	1.00	1.00

Define Close Loop Enable Conditions

KtFSTA_t_ClosedLoopAutostart **(HYBRID ONLY)**

AutoStart Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104
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

AutoStart Coolant	116	128	140	152
Close Loop Enable Time	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
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

Start-Up Coolant	116	128	140	152
Close Loop Enable Time	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**
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

81.2305	**87.479**	**93.7275**	**99.976**
-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**
Curve	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

39.0	**42.0**	**45.0**	**48.0**
30.0	30.0	30.0	30.0

P0411

Include only if duel bank system
SL Threshold Bank 2 Table (duel Bank systems only) **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**
Curve	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

39.0	**42.0**	**45.0**	**48.0**
30.0	30.0	30.0	30.0

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
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

39.0	42.0	45.0	48.0
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
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

18.0	19.0	20.0	21.0
0.5	0.0	0.0	0.0

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

P2436 — Include P2436 only if duel bank system

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
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

26.0	28.0	30.0	32.0
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	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5

P2440

Include only if duel bank system

Bank 2 Valve Pressure Error — axis weighted time in seconds

Axis	0	1	2	3	4	5	6	7	8
Curve	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5

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	0.0	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
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

39.0	42.0	45.0	48.0
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
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

18.0	19.0	20.0	21.0
0.5	0.0	0.0	0.0

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_ClosedLoopAutostart **(HYBRID ONLY)**

AutoStart Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104
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

AutoStart Coolant	116	128	140	152
Close Loop Enable Time	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
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

Start-Up Coolant	116	128	140	152
Close Loop Enable Time	0.0	0.0	0.0	0.0

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

Long-Term Fuel Trim Cell Usage

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

Cell I.D.	CeFADR_e_Cell13_PurgOffAirMode0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
FASD Cell Usage	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_NonSelectedCell
FASD Enabled In Cell?	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
900	900	900	900	900	900	900	900	900	900	900	900	900

116	128	140	152
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
80	80	80	60	60	40	40	30	30	30	30	30	30

116	128	140	152
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	15155	13715	12275	10835	9395	7955	6515	5075	3635	2195	755
Alternate	-7.0 ° C	10.0 ° C	13444	12112	10780	9448	8116	6784	5452	4120	2788	1456	124

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

P0300-P0308: SCD Delta ddt (Con't)

load

	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
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
7	1800	1800	1800	1200	1150	725	575	550	400	175	125	85	75
9	1800	1800	1800	1200	1150	725	575	550	400	175	125	85	75
11	1800	1800	1800	1600	1150	725	575	550	400	175	125	85	75
12	1800	1800	1800	1600	1000	750	575	550	400	175	125	85	75
13	1800	1800	1800	1600	1000	750	575	550	400	175	125	85	75
15	1800	1800	1800	1600	1000	800	575	550	400	180	125	85	75
17	1800	1800	1800	1700	1000	800	600	550	400	225	150	100	80
19	1800	1800	1800	1700	1000	800	700	550	400	250	175	120	100
22	1800	1800	1800	1700	1040	970	750	600	450	250	200	130	100
25	3500	3500	3500	2150	1200	1200	800	750	550	250	250	150	120
29	3500	3500	3500	2400	1400	1600	800	800	700	375	250	160	135
33	4500	4500	4500	3000	1800	1800	1000	900	700	400	250	200	150
38	4500	4500	4500	3500	2000	1800	1100	1000	800	600	350	250	180
42	5000	5000	5000	4000	3000	2500	1500	1400	1000	600	375	300	210
48	5500	5500	5500	4500	3500	3000	2500	2000	1400	600	500	350	260
54	6000	6000	6000	5000	4000	3500	2500	2500	1600	700	500	400	300
60	6500	6500	6500	5500	4500	4000	3000	3000	2000	800	600	450	350

Load	2200	2400	2600	2800	3000	3500	4000	4500	5000	5500	6000	6500	7000
7	70	30	20	20	20	12	22	12	13	11	10	8	7
9	70	40	25	22	22	12	10	11	12	7	10	8	7
11	70	40	25	22	20	13	10	10	10	7	7	8	7
12	70	40	30	25	20	15	10	9	7	7	7	7	7
13	70	40	35	30	25	17	11	9	6	6	7	7	7
15	70	45	40	30	30	19	12	9	6	5	7	7	7
17	70	50	45	35	30	20	12	10	7	6	7	7	7
19	70	55	50	45	40	24	15	10	8	6	6	7	7
22	75	70	55	50	40	25	17	11	9	7	7	7	7
25	95	80	65	55	50	30	19	12	10	8	7	7	7
29	110	90	75	60	50	32	22	17	12	8	8	7	7
33	120	100	85	70	60	35	25	17	13	10	8	7	7
38	145	120	100	80	70	45	27	20	15	11	9	7	7
42	160	135	125	100	80	50	35	25	17	13	11	8	8
48	225	175	125	100	80	60	40	26	19	15	13	9	9
54	220	175	150	125	100	70	45	31	22	18	14	14	14
60	275	185	175	145	145	80	65	35	24	20	16	15	15

P0300-P0308: Cyl Mode ddt

load	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000
7	1400	1400	1400	1200	1200	725	600	840	500	300	175	125	110
9	1400	1400	1400	1200	1200	725	600	550	500	300	175	125	110
11	1500	1500	1500	1500	1200	800	800	550	500	300	200	125	110
12	1800	1800	1800	1300	1200	900	800	575	500	300	200	125	110
13	1800	1800	1800	1400	1200	1000	800	575	500	300	200	130	110
15	1800	1800	1800	1600	1400	1300	800	575	500	300	200	145	110
17	1800	1800	1800	2100	1500	1300	800	700	600	300	225	170	125
19	2000	2000	2000	2200	2000	1300	900	1000	600	450	275	200	175
22	2400	2400	2400	2500	2100	1800	1300	1000	750	500	310	225	200
25	3800	3800	3800	2500	2100	2500	1300	1300	1000	800	475	275	250
29	4000	4000	4000	3400	2600	3000	1300	1300	1200	800	475	325	250
33	5500	5500	5500	4000	3500	3800	1600	1400	1200	800	500	400	300
38	6000	6000	6000	4500	3500	3800	1800	1500	1200	1200	525	500	350
42	8000	8000	8000	5000	4000	4000	2400	2000	1400	1200	625	500	400
48	9000	9000	9000	5500	5000	5000	3000	2500	2000	1200	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

load	2200	2400	2600	2800	3000	3500	4000	4500	5000	5500	6000	6500	7000
7	90	55	40	40	30	22	22	13	13	11	10	12	12
9	90	60	45	35	30	20	14	14	12	10	10	12	12
11	90	60	45	35	25	23	16	14	10	10	10	11	11
12	90	60	45	35	33	24	18	14	11	10	10	11	11
13	90	60	50	40	35	27	20	14	11	10	10	11	11
15	90	80	75	50	40	27	22	15	12	10	10	11	11
17	110	90	75	50	40	30	24	18	13	10	11	10	10
19	135	110	100	60	60	30	27	18	15	12	11	10	10
22	150	150	125	80	70	35	27	25	17	13	11	10	10
25	200	180	125	110	100	45	42	30	20	16	13	10	10
29	250	225	140	125	110	55	50	35	25	20	15	11	11
33	250	225	175	150	125	65	60	40	30	22	17	13	13
38	350	225	200	200	125	75	60	50	40	30	19	14	14
42	350	300	200	200	175	85	70	60	40	35	22	16	16
48	450	300	225	220	175	100	90	65	45	40	24	20	20
54	450	350	300	250	200	125	100	70	55	45	35	25	25
60	450	350	300	250	200	150	125	75	55	45	35	27	27

P0300-P0308: Rev Mode Table

OR (decel index > Rev Mode Table)

load

	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3500	4000
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

load

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

P0300-P0308: AFM Mode Table

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

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

load
Load

	2200	2400	2600	2800	3000	3500	4000	4500	5000	5500	6000	6500	7000
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: Zero torque engine load

Zero Torque: All Cylinders active

RPM	Pct load
400	12.00
500	10.00
600	8.50
700	8.00
800	8.00
900	8.00
1000	8.00
1100	8.00
1200	8.00
1400	8.00
1600	8.00
1800	8.00
2000	8.00
2200	8.00
2400	8.00
2600	8.00
2800	8.00
3000	9.00
3500	11.37
4000	13.74
4500	16.11
5000	18.48
5500	20.85
6000	23.22
6500	25.59
7000	27.20

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

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

	0.225	0.240	1.000
0.000	0	0	0
0.030	0	0	0
0.045	0	0	0
0.060	0	0	0
0.075	0	0	0
0.090	0	0	0
0.105	0	0	0
0.120	0	0	0
0.135	0	0	0
0.150	0	0	0
0.165	0	0	0
0.180	0	0	0
0.195	0	0	0
0.210	0	0	0
0.225	0	0	0
0.240	0	0	0
1.000	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	34	34	34	34	34
6.3	34	34	34	34	34
12.5	34	34	34	34	34
18.8	34	34	34	34	34
25.0	34	34	34	34	34
31.3	34	34	34	34	34
37.5	34	34	34	34	34
43.8	34	34	34	34	34
50.0	34	34	34	34	34
56.3	34	34	34	34	34
62.5	34	34	34	34	34
68.8	34	34	34	34	34
75.0	34	34	34	34	34
81.3	34	34	34	34	34
87.5	34	34	34	34	34
93.8	34	34	34	34	34
100.0	34	34	34	34	34

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	34	34	34	34	34
6.3	34	34	34	34	34
12.5	34	34	34	34	34
18.8	34	34	34	34	34
25.0	34	34	34	34	34
31.3	34	34	34	34	34
37.5	34	34	34	34	34
43.8	34	34	34	34	34
50.0	34	34	34	34	34
56.3	34	34	34	34	34
62.5	34	34	34	34	34
68.8	34	34	34	34	34
75.0	34	34	34	34	34
81.3	34	34	34	34	34
87.5	34	34	34	34	34
93.8	34	34	34	34	34
100.0	34	34	34	34	34

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	34	34	34	34	34
6.3	34	34	34	34	34
12.5	34	34	34	34	34
18.8	34	34	34	34	34
25.0	34	34	34	34	34
31.3	34	34	34	34	34
37.5	34	34	34	34	34
43.8	34	34	34	34	34
50.0	34	34	34	34	34
56.3	34	34	34	34	34
62.5	34	34	34	34	34
68.8	34	34	34	34	34
75.0	34	34	34	34	34
81.3	34	34	34	34	34
87.5	34	34	34	34	34
93.8	34	34	34	34	34
100.0	34	34	34	34	34

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	34	34	34	34	34
6.3	34	34	34	34	34
12.5	34	34	34	34	34
18.8	34	34	34	34	34
25.0	34	34	34	34	34
31.3	34	34	34	34	34
37.5	34	34	34	34	34
43.8	34	34	34	34	34
50.0	34	34	34	34	34
56.3	34	34	34	34	34
62.5	34	34	34	34	34
68.8	34	34	34	34	34
75.0	34	34	34	34	34
81.3	34	34	34	34	34
87.5	34	34	34	34	34
93.8	34	34	34	34	34
100.0	34	34	34	34	34

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
	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

Temp	128	140	152
	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
Close Loop Enable Time	0	0	0	0	19	19	19	19	19	19	0	0	0	0

Start-Up Coolant	128	140	152
Close Loop Enable Time	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

	128.0000	140.0000	152.0000
400	6.0000	6.0000	6.0000
800	6.0000	6.0000	6.0000
1200	6.0000	6.0000	6.0000
1600	6.0000	6.0000	6.0000
2000	6.0000	6.0000	6.0000
2400	6.0000	6.0000	6.0000
2800	6.0000	6.0000	6.0000
3200	6.0000	6.0000	6.0000
3600	6.0000	6.0000	6.0000
4000	6.0000	6.0000	6.0000
4400	6.0000	6.0000	6.0000
4800	6.0000	6.0000	6.0000
5200	6.0000	6.0000	6.0000
5600	6.0000	6.0000	6.0000
6000	6.0000	6.0000	6.0000
6400	6.0000	6.0000	6.0000
6800	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

	128.0000	140.0000	152.0000
400	6.0000	6.0000	6.0000
800	6.0000	6.0000	6.0000
1200	6.0000	6.0000	6.0000
1600	6.0000	6.0000	6.0000
2000	6.0000	6.0000	6.0000
2400	6.0000	6.0000	6.0000
2800	6.0000	6.0000	6.0000
3200	6.0000	6.0000	6.0000
3600	6.0000	6.0000	6.0000
4000	6.0000	6.0000	6.0000
4400	6.0000	6.0000	6.0000
4800	6.0000	6.0000	6.0000
5200	6.0000	6.0000	6.0000
5600	6.0000	6.0000	6.0000
6000	6.0000	6.0000	6.0000
6400	6.0000	6.0000	6.0000
6800	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

	128.0000	140.0000	152.0000
400	0.0000	0.0000	0.0000
800	0.0000	0.0000	0.0000
1200	0.0000	0.0000	0.0000
1600	0.0000	0.0000	0.0000
2000	0.0000	0.0000	0.0000
2400	0.0000	0.0000	0.0000
2800	0.0000	0.0000	0.0000
3200	0.0000	0.0000	0.0000
3600	0.0000	0.0000	0.0000
4000	0.0000	0.0000	0.0000
4400	0.0000	0.0000	0.0000
4800	0.0000	0.0000	0.0000
5200	0.0000	0.0000	0.0000
5600	0.0000	0.0000	0.0000
6000	0.0000	0.0000	0.0000
6400	0.0000	0.0000	0.0000
6800	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

	128.0000	140.0000	152.0000
400	0.0000	0.0000	0.0000
800	0.0000	0.0000	0.0000
1200	0.0000	0.0000	0.0000
1600	0.0000	0.0000	0.0000
2000	0.0000	0.0000	0.0000
2400	0.0000	0.0000	0.0000
2800	0.0000	0.0000	0.0000
3200	0.0000	0.0000	0.0000
3600	0.0000	0.0000	0.0000
4000	0.0000	0.0000	0.0000
4400	0.0000	0.0000	0.0000
4800	0.0000	0.0000	0.0000
5200	0.0000	0.0000	0.0000
5600	0.0000	0.0000	0.0000
6000	0.0000	0.0000	0.0000
6400	0.0000	0.0000	0.0000
6800	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

	128.0000	140.0000	152.0000
400	3.000	3.000	3.000
800	3.000	3.000	3.000
1200	3.000	3.000	3.000
1600	3.000	3.000	3.000
2000	3.000	3.000	3.000
2400	3.000	3.000	3.000
2800	3.000	3.000	3.000
3200	3.000	3.000	3.000
3600	3.000	3.000	3.000
3600	3.000	3.000	3.000
4400	3.000	3.000	3.000
4800	3.000	3.000	3.000
5200	3.000	3.000	3.000
5600	3.000	3.000	3.000
6000	3.000	3.000	3.000
6400	3.000	3.000	3.000
6800	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

	128.0000	140.0000	152.0000
400	3.000	3.000	3.000
800	3.000	3.000	3.000
1200	3.000	3.000	3.000
1600	3.000	3.000	3.000
2000	3.000	3.000	3.000
2400	3.000	3.000	3.000
2800	3.000	3.000	3.000
3200	3.000	3.000	3.000
3600	3.000	3.000	3.000
4000	3.000	3.000	3.000
4400	3.000	3.000	3.000
4800	3.000	3.000	3.000
5200	3.000	3.000	3.000
5600	3.000	3.000	3.000
6000	3.000	3.000	3.000
6400	3.000	3.000	3.000
6800	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
Curve	15000	14000	13000	12000	11000	10000	9000	8000	7000	6000	5000	4000	5000	4000

Axis	128	140	152
Curve	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	875.0	875.0	875.0	875.0	875.0	875.0	875.0	875.0	875.0

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	875	875	875	875	875	875	875	875	875	875

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

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

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
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

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

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	29.0000	35.1016	33.2969	32.5000	27.7031	24.7031	100.0000	100.0000	100.0000

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

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

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

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

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

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

P1682: Ignition Voltage 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

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

P0606

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

X-axis	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
Data	0.2000	0.2000	0.2000

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

X-axis	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
Data	0.2000	0.2000	0.2000

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

X-axis	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
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
80.00	37.70	29.22	47.61	55.19	64.38	72.75	69.09	65.23	61.02	55.73	49.66	43.14	36.91	40.56
160.00	36.20	29.55	38.84	41.86	47.19	52.22	49.89	46.69	41.83	38.38	35.95	32.78	29.72	33.45
240.00	34.81	30.08	32.91	32.52	33.55	34.69	33.11	31.61	30.22	29.09	28.17	26.38	24.59	28.33
320.00	33.53	30.77	28.59	26.61	25.67	25.08	24.28	23.73	23.64	23.05	22.06	21.41	20.97	24.42
400.00	32.34	31.61	25.05	22.45	20.86	19.61	19.16	19.02	19.44	19.02	17.97	17.61	17.53	20.36
480.00	30.88	32.36	22.25	19.42	17.58	16.11	15.83	15.83	16.38	16.06	15.14	14.89	14.88	17.36
560.00	28.38	30.48	20.03	17.11	15.22	13.66	13.48	13.55	14.08	13.86	13.08	12.89	12.94	15.14
640.00	26.25	28.83	18.23	15.28	13.42	11.86	11.73	11.84	12.34	12.17	11.50	11.36	11.44	13.42
720.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19
800.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19
880.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19
960.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19
1040.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19
1120.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19
1200.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19
1280.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19
1360.00	24.61	27.22	16.89	13.97	12.14	10.63	10.53	10.64	11.14	11.00	10.39	10.28	10.36	12.19

APC/Erpm	7230.39	7711.13	8191.88
80.00	42.47	42.47	42.47
160.00	35.41	35.41	35.41
240.00	30.28	30.28	30.28
320.00	26.22	26.22	26.22
400.00	21.83	21.83	21.83
480.00	18.66	18.66	18.66
560.00	16.30	16.30	16.30
640.00	14.45	14.45	14.45
720.00	13.14	13.14	13.14
800.00	13.14	13.14	13.14
880.00	13.14	13.14	13.14
960.00	13.14	13.14	13.14
1040.00	13.14	13.14	13.14
1120.00	13.14	13.14	13.14
1200.00	13.14	13.14	13.14
1280.00	13.14	13.14	13.14
1360.00	13.14	13.14	13.14

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

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

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

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

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

	-40.0000	-20.0000	-10.0000	0.0000	50.0000	90.0000
200.0000	4096.0000	4096.0000	4096.0000	4096.0000	4096.0000	4096.0000
375.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
525.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
625.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
825.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
1025.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
1225.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
1425.0000	25.0000	25.0000	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**
0.0000	2	2	2	2	2	1	1	0	0	0	0	0	0	0
12.5000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0
25.0000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0
37.5000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0
50.0000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0
62.5000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0
75.0000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0
87.5000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0
100.0000	**2**	2	2	2	2	1	1	0	0	0	0	0	0	0

Eth %	**80**	**96**	**112**
0.0000	0	0	0
12.5000	0	0	0
25.0000	0	0	0
37.5000	0	0	0
50.0000	0	0	0
62.5000	0	0	0
75.0000	0	0	0
87.5000	0	0	0
100.0000	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
0.0000	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
25.0000	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
50.0000	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
75.0000	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
100.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Eth %	80	96	112
0.0000	10	10	10
12.5000	10	10	10
25.0000	10	10	10
37.5000	10	10	10
50.0000	10	10	10
62.5000	10	10	10
75.0000	10	10	10
87.5000	10	10	10
100.0000	10	10	10

P00C6 KtFHPC_p_HighPressStart

Coolant Axis

Eth %	-40	-32	-24	-16	-8	0	8	16	20	24	32	40	48	64
0.0000	8	8	6	4	3	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
25.0000	8	8	6	4	3	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
50.0000	8	8	6	4	3	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
75.0000	8	8	6	4	3	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
100.0000	8	8	6	4	3	1	1	1	1	1	1	1	1	1

Eth %	80	96	112
0.0000	1	1	1
12.5000	1	1	1
25.0000	1	1	1
37.5000	1	1	1
50.0000	1	1	1
62.5000	1	1	1
75.0000	1	1	1
87.5000	1	1	1
100.0000	1	1	1

P00C6

KtFHPC_t_HighPressStartTmout

Coolant Axis

-40	**-32**	-24	-16	-8	0	8	16	20	24	32	40	48	64
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

80	96	112
3.0	3.0	3.0

P0089
P163A
P228C
P228D
P0191

KtFHPD_t_PumpCntrlEngRunThrsh

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

P0191

KtFHPD_t_SnsPrfStuckCrankTmout

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

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

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

Cell I.D.	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
FASD Cell Usage	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_NonSelectedCell
FASD Enabled In Cell?	Yes	NO

Closed Loop Enable Criteria

Engine run time greater than
KtFSTA_t_ClosedLoopAutostart **(HYBRID ONLY)**

AutoStart Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116
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

AutoStart Coolant	128	140	152
Close Loop Enable Time	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
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

Start-Up Coolant	128	140	152
Close Loop Enable Time	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

	> 20 events
Time (events * 12.5 milliseconds)	

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 enable
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
Coolant	*Celcius*

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

	> 80 events
Time (events * 12.5 milliseconds)	

Long Term Secondary Fuel Trim Enable Criteria

X10	X11	X12	X13	X14	X15	X16	X17
Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17

KtFCLP_t_PostIntglDisableTime

Start-Up Coolant	-40	-29	-18	-6	5	16	28	39	50	61	73	84	95	106
Post Integral Enable Time	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Start-Up Coolant	118	129	140
Post Integral Enable Time	100.0	100.0	100.0

Plus
KtFCLP_t_PostIntglRampInTime

							X10	X11	X12	X13	X14	X15	X16	X17
							Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
Start-Up Coolant	-40	-29	-18	-6	5	16	28	39	50	61	73	84	95	106
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

118	129	140
10.0	10.0	10.0

and
KeFCLP_T_IntegrationCatalystMax

	< 1000
Modeled Catalyst Temperature	*Celcius*

and
KeFCLP_T_IntegrationCatalystMin

Modeled Catalyst Temperature	*> 0 Celcius*

and
PO2S_Bank_1_Snsr_2_FA and PO2S_Bank_2_Snsr_2_FA = False

Fault Bundle Definitions

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes										
Genslak		CATR	GetCATR_b_CatSysEffLoB1_FA	CatalystSysEfficiencyLoB1_FA	P0420										
			GetCATD_b_CatSysEffLoB2_FA	CatalystSysEfficiencyLoB2_FA	P0430										
		CSED	**No fault bundle produced that is consumed by other rings**												
Hall	Evap	EVPR	GetEVPR_b_Purg1SlndCkt_FA	EvapPurgeSolenoidCircuit_FA	P0443										
			GetEVPR_b_FlowDurNonPurg_FA	EvapFlowDuringNonPurge_FA	P0496										
			GetEVPR_b_VentSlndCkt_FA	EvapVentSolenoidCircuit_FA	P0449										
			GetEVPR_b_SmallLeak_FA	EvapSmallLeak_FA	P0442										
			GetEVPR_b_EmissionSys_FA	EvapEmissionSystem_FA	P0455	P0446									
			GetEVPR_b_FTP_Circuit_FA	FuelTankPressureSnsrCkt_FA	P0452	P0453									
Hall	Eng Interface	FANR	GetFANR_b_FanSpeedTooHiFA	CoolingFanSpeedTooHigh_FA	P0495										
Hall	Evap	FLVR	GetFLVR_b_FuelLvlDataFlt	FuelLevelDataFault	P0461	P0462	P0463	P2066	P2067	P2068					
Hall	Engine Interface	PMDR	GetPMDR_b_PT_RelayFlt	PowertrainRelayFault	P1682										
			GetPMDR_b_PT_RelayStOnFA	PowertrainRelayStateOn_FA	P0685										
			GetPMDC_b_PT_RelayStOnError	PowertrainRelayStateOn_Error	P0685										
			GetPMDR_b_IgnOffTmeFA	IgnitionOffTimer_FA	P2610										
			GetPMDR_b_IgnOffTmeVld	GetPMDR_b_IgnOffTmeVld	IgnitionO	P2610									
			GetEPSR_TmSinceEngRunningValid	GetEPSR_TmSinceEngRunningVa	TimeSinc	P2610									
Hall	Vehicle Infrastructure PMT	VSPR	GetVSPR_b_VehicleSpeedFA	VehicleSpeedSensor_FA	P0502	P0503	P0722	P0723							
			automatics	See Trans Summary Table											
MacEwen		FADR	GetFADR_b_FuelTrimSysB1_FA	FuelTrimSystemB1_FA	P0171	P0172									
			GetFADR_b_FuelTrimSysB2_FA	FuelTrimSystemB2_FA	P0174	P0175									
			GetFADR_b_FuelTrimSysB1_TFTKO	FuelTrimSystemB1_TFTKO	P0171	P0172									
			GetFADR_b_FuelTrimSysB2_TFTKO	FuelTrimSystemB2_TFTKO	P0174	P0175									
		OXYR - AFIM	GetDFIR_FaultActive(CeDFIR_e_FuelTrimCylBalB1)	A/F Imbalance Bank1	P219A										
			GetDFIR_FaultActive(CeDFIR_e_FuelTrimCylBalB2)	A/F Imbalance Bank2	P219B										
MacEwen	Secondary Air	AIRR	GetAIRR_b_AIR_PresSensorFault	AIRSystemPressureSensor FA	P2430	P2431	P2432	P2433	P2435	P2436	P2437	P2438			
			GetAIRR_b_AIR_Sys_FA	AIR System FA	P0411	P2440	P2444								
			GetDFIR_FaultActive(CeDFIR_e_AIR_SlndCktB1)	AIRValveControlCircuit FA	P0412										
			GetDFIR_FaultActive(CeDFIR_e_AIR_PmpCktB1)	AIRPumpControlCircuit FA	P0418										
MacEwen	Clutch	MTCR	GetMTCR_b_ClchPstnEmisFA	Clutch Sensor FA	P0806	P0807	P0808								
			GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktLo)	ClutchPositionSensorCircuitLo FA	P0807										
			GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktHi)	ClutchPositionSensorCircuitHi FA	P0808										
MacEwen	Closed Loop Fuel	E85R	GetE85R_b_FFS_CompFA	Ethanol Composition Sensor FA	P0178	P0179	P2269								
Mathews	Misfire PDT	MSFR	GetMSFR_b_EngMisfDtctd_TFTKO	EngineMisfireDetected_TFTKO	P0300	P0301	P0302	P0303	P0304	P0305	P0306	P0307	P0308		
			GetMSFR_b_EngMisfDtctd_FA	EngineMisfireDetected_FA	P0300	P0301	P0302	P0303	P0304	P0305	P0306	P0307	P0308		
Sawdon	Spark/ESC	KNKR	VeKNKR_b_KS_CktPerfB1B2_FA	KS_Ckt_Perf_B1B2_FA	P0324	P0325	P0326	P0327	P0328	P0330	P0332	P0333	P06B6	P06B7	
Sawdon	Spark/ESC	SPKR	VeSPKR_b_EST_DriverFltActive	IgnitionOutputDriver_FA	P0351	P0352	P0353	P0354	P0355	P0356	P0357	P0358			
Siekkinen	O2 PDT	OXYR	VaOXYI_O2_TestFailedThisKeyOn[CiFADR_FuelBank1]	O2S_Bank_ 1_TFTKO	P0131	P0132	P0134	P2A00							
			VaOXYI_O2_TestFailedThisKeyOn[CiFADR_FuelBank2]	O2S_Bank_ 2_TFTKO	P0151	P0152	P0154	P2A03							
			NeOXYI_b_Bank1Snsr1_FA	O2S_Bank_1_Sensor_1_FA	P2A00	P0131	P0132	P0133	P0134	P0135	P0053	P1133			
			NeOXYI_b_Bank1Snsr2_FA	O2S_Bank_1_Sensor_2_FA	P013A	P013B	P013E	P013F	P2270	P2271	P0137	P0138	P0140	P0141	P0054
			NeOXYI_b_Bank2Snsr1_FA	O2S_Bank_2_Sensor_1_FA	P2A03	P0151	P0152	P0153	P0154	P0155	P0059	P1153			
			NeOXYI_b_Bank2Snsr2_FA	O2S_Bank_2_Sensor_2_FA	P013C	P013D	P014A	P014B	P2272	P2273	P0157	P0158	P0160	P0161	P0060
		ECTI	NeECTI_b_ECT_SnsrCktFA	ECT_Sensor_Ckt_FA	P0117	P0118									
		ECTI	NeECTI_b_ECT_SnsrCktTPTKO	ECT_Sensor_Ckt_TPTKO	P0117	P0118									
		ECTI	NeECTI_b_ECT_SnsrCktTFTKO	ECT_Sensor_Ckt_TFTKO	P0117	P0118									
		ECTI	NeECTI_b_DfltECT_CondDtctd	ECT_Sensor_DefaultDetected	P0117	P0118	P0116	P0125							
		ECTI	NeECTI_b_ECT_SnsrFA	ECT_Sensor_FA	P0117	P0118	P0116	P0125	P0128						
		ECTI	NeECTI_b_ECT_SnsrTFTKO	ECT_Sensor_TFTKO	P0117	P0118	P0116	P0125							
		ECTI	NeECTI_b_ECT_SnsrPerfFA	ECT_Sensor_Perf_FA	P0116										
		ECTI	VeECTI_b_ECT_SnsrCktFP	ECT_Sensor_Ckt_FP	P0117	P0118									
		ECTI	GetECTI_b_ECT_SnsrCktHiFP	ECT_Sensor_Ckt_High_FP	P0118										
		ECTI	GetETCI_b_ECT_SnsrCktLoFP	ECT_Sensor_Ckt_Low_FP	P0117										
Wiggins	Air Measurement	AAPR	GetAAPR_b_AAP_SnsrFA (naturally aspirated)	AAP_SnsrFA_NA	P2227	P2228	P2229	P2230							
			GetAAPR_b_AAP_SnsrFA (turbocharged)	AAP_SnsrFA_TC	P0237	P0238									
			GetAAPR_b_AAP_SnsrCktFP (naturally aspirated)	AAP_SnsrCktFP_NA	P2228	P2229									
			GetAAPR_b_AAP_SnsrCktFP (turbocharged)	AAP_SnsrCktFP_TC	P0237	P0238									
			GetAAPR_b_AAP_SnsrTFTKO (naturally aspirated)	AAP_SnsrTFTKO_NA	P2227	P2228	P2229	P2230							
			GetAAPR_b_AAP_SnsrTFTKO (turbocharged)	AAP_SnsrTFTKO_TC	P0237	P0238									
			GetAAPR_b_AAP2_SnsrFA	AAP2_SnsrFA	P2227	P2228	P2229	P2230							
			GetAAPR_b_AAP2_SnsrCktFP	AAP2_SnsrCktFP	P2228	P2229									
			GetAAPR_b_AAP2_SnsrTFTKO	AAP2_SnsrTFTKO	P2227	P2228	P2229	P2230							
			GetAAPR_b_TC_BoostPresSnsrCktFA	TC_BoostPresSnsrCktFA	P0237	P0238									
			GetAAPR_b_TC_BoostPresSnsrFA	TC_BoostPresSnsrFA	P0236	P0237	P0238								
			GetAAPR_b_AmbPresSnsrCktFA	AmbPresSnsrCktFA	P2228	P2229									
			GetAAPR_b_AmbPresSnsrCktFP	AmbPresSnsrCktFP	P2228	P2229									
			GetAAPR_b_AmbientAirPresDfltd (baro/TIAP sensor)	AmbientAirDefault_Snsr	P2227	P2228	P2229	P2230							

Fault Bundle Definitions

			GetAAPR_b_AmbientAirPresDfltd (no baro/TIAP sensor)	AmbientAirDefault_NoSnsr	P0101	P0102	P0103	P0106	P0107	P0108	P0111	P0112	P0113	P0114	P0121	P0122	P0123	P012B	P012C	P012D	P0222	P0223	P1221
			GetAAPR_e_AmbPresDfltdStatus (baro/TIAP sensor)	AmbPresDfltdStatus_Snsr	P2227	P2228	P2229	P2230															
			GetAAPR_e_AmbPresDfltdStatus (no baro/TIAP sensor)	AmbPresDfltdStatus_NoSnsr	P0101	P0102	P0103	P0106	P0107	P0108	P0111	P0112	P0113	P0114	P0121	P0122	P0123	P012B	P012C	P012D	P0222	P0223	P1221
Wiggins	Air Measurement	EITR	GetEITR_b_IAT_SnsrCktTFTKO	IAT_SensorCircuitTFTKO	P0112	P0113																	
			GetEITR_b_IAT_SnsrCktFA	IAT_SensorCircuitFA	P0112	P0113																	
			GetEITR_b_IAT_SnsrCktFP	IAT_SensorCircuitFP	P0112	P0113																	
			GetEITR_b_IAT_SnsrTFTKO	IAT_SensorTFTKO	P0111	P0112	P0113																
			GetEITR_b_IAT_SnsrFA	IAT_SensorFA	P0111	P0112	P0113																
			GetEITR_b_IAT_2_SnsrCktTFTKO (IAT2 Present)	IAT2_SensorCktTFTKO	P0097	P0098																	
			GetEITR_b_IAT_2_SnsrCktTFTKO (IAT2 Not Present)	IAT2_SensorCktTFTKO_NoSnsr	P0112	P0113																	
			GetEITR_b_IAT_2_SnsrCktFA (IAT2 Present)	IAT2_SensorCircuitFA	P0097	P0098																	
			GetEITR_b_IAT_2_SnsrCktFA (IAT2 Not Present)	IAT2_SensorCircuitFA_NoSnsr	P0112	P0113																	
			GetEITR_b_IAT_2_SnsrCktFP (IAT2 Present)	IAT2_SensorcircuitFP	P0097	P0098																	
			GetEITR_b_IAT_2_SnsrCktFP (IAT2 Not Present)	IAT2_SensorcircuitFP_NoSnsr	P0112	P0113																	
			GetEITR_b_IAT_2_SnsrTFTKO (IAT2 Present)	IAT2_SensorTFTKO	P0096	P0097	P0098																
			GetEITR_b_IAT_2_SnsrTFTKO (IAT2 Not Present)	IAT2_SensorTFTKO_NoSnsr	P0111	P0112	P0113																
			GetEITR_b_IAT_2_SnsrFA (IAT2 Present)	IAT2_SensorFA	P0096	P0097	P0098																
			GetEITR_b_IAT_2_SnsrFA (IAT2 Not Present)	IAT2_SensorFA_NoSnsr	P0111	P0112	P0113																
			GetEITR_b_ThrotTempSnsrTFTKO (IAT2 Present)	ThrotTempSensorTFTKO	P0096	P0097	P0098																
			GetEITR_b_ThrotTempSnsrTFTKO (IAT2 Not Present)	ThrotTempSensorTFTKO_NoSnsr	P0111	P0112	P0113																
			GetEITR_b_ThrotTempSnsrFA (IAT2 Present)	ThrotTempSensorFA	P0096	P0097	P0098																
			GetEITR_b_ThrotTempSnsrFA (IAT2 Not Present)	ThrotTempSensorFA_NoSnsr	P0111	P0112	P0113																
Wiggins	Air Measurement	IFRR	GetIFRR_b_ChgrBypVlvFault	SuperchargerBypassValveFA	P2261																		
			GetIFRR_b_CylDeacSys_TFTKO	CylDeacSystemTFTKO	P3400																		
			GetIFRR_b_MAF_SnsrPerfFault	MAF_SensorPerfFA	P0101																		
			GetIFRR_b_MAF_SnsrPerf_TFTKO	MAF_SensorPerfTFTKO	P0101																		
			GetIFRR_b_MAP_SnsrPerfFault	MAP_SensorPerfFA	P0106																		
			GetIFRR_b_MAP_SnsrPerf_TFTKO	MAP_SensorPerfTFTKO	P0106																		
			GetIFRR_b_SCIAP_SnsrPerfFault	SCIAP_SensorPerfFA	P012B																		
			GetIFRR_b_SCIAP_SnsrPerf_TFTKO	SCIAP_SensorPerfTFTKO	P012B																		
			GetIFRR_b_TP_SnsrPerfFault	ThrottlePositionSnsrPerfFA	P0121																		
			GetIFRR_b_TP_SnsrPerf_TFTKO	ThrottlePositionSnsrPerfTFTKO	P0121																		
			GetIFRR_b_TIAP_SnsrPerfFault	TIAP_SensorPerfFA	P0236																		
Wiggins	Air Measurement	MAFR	GetMAFR_b_MAF_SnsrFA	MAF_SensorFA	P0101	P0102	P0103																
			GetMAFR_b_MAF_SnsrTFTKO	MAF_SensorTFTKO	P0101	P0102	P0103																
			GetMAFR_b_MAF_SnsrFP	MAF_SensorFP	P0102	P0103																	
			GetMAFR_b_MAF_SnsrCktFA	MAF_SensorCircuitFA	P0102	P0103																	
			GetMAFR_b_MAF_SnsrCktTFTKO	MAF_SensorCircuitTFTKO	P0102	P0103																	
Wiggins	Air Measurement	MAPR	GetMAPR_b_MAP_SnsrTFTKO	MAP_SensorTFTKO	P0106	P0107	P0108																
			GetMAPR_b_MAP_SnsrFA	MAP_SensorFA	P0106	P0107	P0108																
			GetMAPR_b_MAP_SnsrCktFP	MAP_SensorCircuitFP	P0107	P0108																	
			GetMAPR_b_SCIAP_SnsrFA	SCIAP_SensorFA	P012B	P012C	P012D																
			GetMAPR_b_SCIAP_SnsrTFTKO	SCIAP_SensorTFTKO	P012B	P012C	P012D																
			GetMAPR_b_SCIAP_SnsrCktFP	SCIAP_SensorCircuitFP	P012C	P012D																	
			GetMAPR_b_AfterThrotBlade_FA (naturally aspirated, turbocharged)	AfterThrottlePressureFA_NA	P0106	P0107	P0108																
			GetMAPR_b_AfterThrotBlade_FA (supercharged)	AfterThrottlePressureFA_SC	P012B	P012C	P012D																
			GetMAPR_b_AftThrotVacSnsr_TFTKO (naturally aspirated, turbocharged)	AfterThrottleVacuumTFTKO_NA	P0106	P0107	P0108																
			GetMAPR_b_AftThrotVacSnsr_TFTKO (supercharged)	AfterThrottleVacuumTFTKO_SC	P012B	P012C	P012D																
			GetMAPR_b_SCIAP_SnsrCktFA	SCIAP_SensorCircuitFA	P012C	P012D																	
			GetMAPR_b_AftThrotPresSnsrTFTKO (naturally aspirated, turbocharged)	AfterThrottlePressTFTKO_NA	P0106	P0107	P0108																
			GetMAPR_b_AftThrotPresSnsrTFTKO (supercharged)	AfterThrottlePressTFTKO_SC	P012B	P012C	P012D																
			GetMAPR_b_MAP_SnsrCktFA	MAP_SensorCircuitFA	P0107	P0108																	
			GetMAPR_e_EngVacStatus() == CeMAPR_e_Defaulted	MAP_EngineVacuumStatus	MAP_SensorFA OR P0107, P0108 Pending																		
Wiggins	Engine Positioning	EPSR	GetEPSR_b_CkpToCamCorr_TFTKO	CrankCamCorrelationTFTKO	P0016	P0017	P0018	P0019															
			GetEPSR_b_CrankSnsr_FA	CrankSensorFA	P0335	P0336																	
			GetEPSR_b_CrankSnsr_TFTKO	CrankSensorTFTKO	P0335	P0336																	
			GetEPSR_b_CamSnsr_FA	CamSensorFA	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
			GetEPSR_b_CamSnsr_TFTKO	CamSensorTFTKO	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
			GetEPSR_b_CkpToCamCorrInt_FA	CrankIntakeCamCorrelationFA	P0016	P0018																	
			GetEPSR_b_CkpToCamCorrExh_FA	CrankExhaustCamCorrelationFA	P0017	P0019																	
			GetEPSR_b_CamSnsrIntake_TFTKO	IntakeCamSensorTFTKO	P0016	P0018	P0340	P0341	P0345	P0346													
			GetEPSR_b_CamSnsrIntake_FA	IntakeCamSensorFA	P0016	P0018	P0340	P0341	P0345	P0346													
			GetEPSR_b_CamSnsrExhaust_TFTKO	ExhaustCamSensorTFTKO	P0017	P0019	P0365	P0366	P0390	P0391													
			GetEPSR_b_CamSnsrExhaust_FA	ExhaustCamSensorFA	P0017	P0019	P0365	P0366	P0390	P0391													
			GetEPSR_b_IntakeSnsrFaultActive	IntakeCamSensor_FA	P0016	P0018	P0340	P0341	P0345	P0346													
			GetEPSR_b_IntakeSnsrTestFailTKO	IntakeCamSensor_TFTKO	P0016	P0018	P0340	P0341	P0345	P0346													
			GetEPSR_b_ExhSnsrFaultActive	ExhaustCamSensor_FA	P0017	P0019	P0365	P0366	P0390	P0391													
			GetEPSR_b_ExhSnsrTestFailTKO	ExhaustCamSensor_TFTKO	P0017	P0019	P0365	P0366	P0390	P0391													
			GetEPSR_b_CkpToCamCorrInt	CrankIntakeCamCorrFA	P0016	P0018																	
			GetEPSR_b_CkpToCamCorrExh	CrankExhaustCamCorrFA	P0017	P0019																	
			GetEPSR_b_CrankSnsrFaultActive	CrankSensorFaultActive	P0335	P0336																	
			GetEPSR_b_CrkSnsrFA	CrankSensor_FA	P0335	P0336																	
			GetEPSR_b_CrankSnsrTestFailTKO	CrankSensorTestFailedTKO	P0335	P0336																	
			GetEPSR_b_CrkSnsrTFTKO	CrankSensor_TFTKO	P0335	P0336																	
			GetEPSR_b_CamSnsrFaultActive	CamSensor_FA	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
			GetEPSR_b_CamSnsrLctnAnyFA	CamSensorAnyLocationFA	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
			GetEPSR_b_CamSnsrTestFailTKO	CamSensor_TFTKO	P0016	P0017	P0018	P0019	P0340	P0341	P0345	P0346	P0365	P0366	P0390	P0391							
Wiggins	Engine Moding	EMDR	GetEMDR_b_EngModeNotRunTmErr	EngModeNotRunTmErr	P2610																		

Fault Bundle Definitions

York	Dilution PDT	PHSR		GetPHSR_b_PhaserBndlFlagFA	AnyCamPhaser_FA	P0010	P0011	P0013	P0014	P0020	P0021	P0023	P0024						
York	Dilution PDT			GetPHSR_b_PhaserBndlFlagTFTKO	AnyCamPhaser_TFTKO	P0010	P0011	P0013	P0014	P0020	P0021	P0023	P0024						
York	Dilution PDT			GetPHSR_b_IcPhaserBndlFlagFA	IntkCamPhaser_FA	P0010	P0011	P0020	P0021										
York	Dilution PDT	EGRR		GetEGRR_b_EGR_ValvePerf_FA	EGRValvePerformance_FA	P0401	P042E												
York	Dilution PDT			GetEGRR_b_EGR_ValveCkt_FA	EGRValveCircuit_FA	P0403	P0404	P0405	P0406										
York	Dilution PDT			GetEGRR_b_EGR_ValveFP	EGRValve_FP	P0405	P0406	P042E											
York	Dilution PDT			GetEGRR_b_EGR_ValveCktTFTKO	EGRValveCircuit_TFTKO	P0403	P0404	P0405	P0406										
York	Dilution PDT			GetEGRR_b_EGR_ValvePerfTFTKO	EGRValvePerformance_TFTKO	P0401	P042E												
Grenn		DFIR		GetACCR_b_AC_FailedOn		no codes?													
Harnack		ACCR		GetEOTI_b_EngOilTempSnsrCktFA()	A/C_FailedOn	P0645													
				GetEOTI_b_EngOilModelValid															
Jess	Oil Attributes PDT		If sensor application	GetEOTI_b_EngOilTempSnsrCktFA()	EngOilTempSensorCircuitFA	P0197	P0198												
Jess	Oil Attributes PDT		if modeled	GetEOTI_b_EngOilModelValid	EngOilModeledTempValid	GetECTR_b_ECT_SnsrFA or GetEITR_b_IAT_SnsrCktFA													
Jess	Oil Attributes PDT	EOPR		GetEOPR_b_ValidEngOil	EngOilPressureSensorCktFA	P0522	P0523												
Jess	Oil Attributes PDT			GetEOPR_b_EOP_SnsrFA	EngOilPressureSensorFA	P0521	P0522	P0523											
Kaiser	AFM PDT	CDAR		GetCDAR_b_AllDeacDriver_TFTKO	CylnderDeacDriverTFTKO	P3401	P3409	P3417	P3425	P3433	P3441	P3449							
Kaiser	AFM PDT	BTRR		GetBTRR_b_BrkBstrSnsrFlt	BrakeBoosterSensorFA	P0556	P0557	P0558											
			If sensor application	GetBBVR_b_BrkBoostVacVld	BrakeBoosterVacuumValid	P0556	P0557	P0558											
			if modeled	GetBBVR_b_BrkBoostVacVld	BrakeBoosterVacuumValid	GetVSPR_b_VehicleSpeedError or GetMAPR_b_MAP_SnsrFA													
Kaiser	Engine Torque PDT	ETQR		GetETQR_EngineTorqueInaccurate	EngineTorqueEstInaccurate	GetMSFI	GetFULF	GetFULF	GetFADF	GetFADF	GetMAFI	GetMAPI	GetEGRR_b_EGR_ValvePerf_FA						
		EOPR		GetEOPI_b_ValidEngOil	EOPCircuit_FA	P0522	P0523												
Miller		FULR		GetFULR_b_FuelInjCkt_FA	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						
		FULR		GetFULR_b_FuelInjCkt_TFTKO	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		GetFHPR_b_PumpCkt_FA	FHPR_b_PumpCkt_FA	P0090	P0091	P0092	P00C8	P00C9	P00CA								
		FHPR		GetFHPR_b_PumpCkt_TFTKO	FHPR_b_PumpCkt_TFTKO	P0090	P0091	P0092	P00C8	P00C9	P00CA								
		FHPR		GetFHPR_b_FRP_SnsrCkt_FA	FHPR_b_FRP_SnsrCkt_FA	P0192	P0193												
		FHPR		GetFHPR_b_FRP_SnsrCkt_TFTKO	FHPR_b_FRP_SnsrCkt_TFTKO	P0192	P0193												
		EMOR		GetEMOC_b_EngMetalOvertempActv true for calibrated time	EngineMetalOvertempActive	P1258													
Kurnik		MEMR			ControllerProcessorPerf_FA	P0606													
				GetTPSR_PerfFaultActive_TPS	ControllerRAM_Error_FA	P0604													
Bauerle		VLTR		GetVLTR_b_V5A_FA	5VoltReferenceA_FA	P0641													
				GetVLTR_b_V5B_FA	5VoltReferenceB_FA	P0651													
Kar	Speed Control PDT	SPDR		GetSPDR_b_IAC_SysRPM_FA	IAC_SystemRPM_FA	P0506	P0507												
Kar	Speed Control PDT	TESR_MSG		GetDFIR_e_TCM_EngSpdReqCkt	TCM_EngSpdReqCkt	P150C													
Worthing	ETC	APSR		GetAPSR_PPS_1_OOR_Flt_Composite()	GetAPSR_PPS_1_OOR_Flt_Comp	P2122	P2123												
				GetAPSR_PPS_2_OOR_Flt_Composite()	GetAPSR_PPS_2_OOR_Flt_Comp	P2127	P2128												
				GetAPSR_b_PPS_1_OOR_Flt_Cmposite()	GetAPSR_b_PPS_1_OOR_Flt_Cm	P2122	P2123												
				GetAPSR_b_PPS_2_OOR_Flt_Cmposite()	GetAPSR_b_PPS_2_OOR_Flt_Cm	P2127	P2128												
				GetAPSR_b_PPS_1_OutofRangeFlt()	GetAPSR_b_PPS_1_OutofRangeF	P2122	P2123												
				GetAPSR_b_PPS_2_OutofRangeFlt()	GetAPSR_b_PPS_2_OutofRangeF	P2127	P2128												
				GetAPSR_PPS_1_OutofRangeFlt()	GetAPSR_PPS_1_OutofRangeFlt()	P2122	P2123												
				GetAPSR_PPS_2_OutofRangeFlt()	GetAPSR_PPS_2_OutofRangeFlt()	P2127	P2128												
		TPSR		GetTPSR_b_TPS1_OOR_FltComposite()	GetTPSR_b_TPS1_OOR_FltComp	P0122	P0123												
				GetTPSR_b_TPS2_OOR_FltComposite()	GetTPSR_b_TPS2_OOR_FltComp	P0222	P0223												
				GetTPSR_b_FaultActive_TPS()	GetTPSR_b_FaultActive_TPS()	P0122	P0123	P0222	P0223	P2135									
				GetTPSR_b_TFTKO_TPS()	GetTPSR_b_TFTKO_TPS()	P0122	P0123	P0222	P0223	P2135									
				GetTPSR_b_PerfFaultActive_TPS()	GetTPSR_b_PerfFaultActive_TPS(	P0068	P0121	P1104	P2100	P2101	P2102	P2103							
				GetTPSR_b_PerfTFTKO_TPS()	GetTPSR_b_PerfTFTKO_TPS()	P0068	P0121	P1104	P2100	P2101	P2102	P2103							
				GetTPSR_ThrotAuthDefault()	GetTPSR_ThrotAuthDefault()	P0068	P0122	P0123	P0222	P0223	P16F3	P1104	P2100	P2101	P2102	P2103	P2135		
		SRAR		GetSRAR_b_EnginePowerLimited()	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					

Fault Bundle Definitions

			Fault Bundles Consumed	
MacEwen		FASD	GetIDLR_b_IAC_SysRPM_FA GetMAPR_b_MAP_SnsrFA GetMAFR_b_MAF_SnsrFA GetMAFR_b_MAF_SnsrTFTKO GetAIRR_b_AIR_Sys_FA GetEVPR_b_Purg1SlndCkt_FA GetEVPR_b_FlowDurNonPurg_FA GetEVPR_b_VentSlndCkt_FA GetEVPR_b_SmallLeak_FA GetEVPR_b_EmissionSys_FA GetEVPR_b_FTP_Circuit_FA GetE85R_b_FFS_CompFA GetFULR_b_FuelInjCkt_FA GetMSFR_b_EngMisfDtctd_FA GetEGRR_b_EGR_ValvePerf_FA GetEGRR_b_EGR_ValveCkt_FA GetMAPR_e_EngVacStatus GetAAPR_e_AAP_DfltdStatus	
MacEwen		AFIM	GetMSFR_b_EngMisfDtctd_FA GetMAPR_b_MAP_SnsrFA GetMAFR_b_MAF_SnsrFA GetECTR_b_ECT_SnsrFA GetE85R_b_FFS_CompFA GetTPSR_ThrotAuthDefault GetFULR_b_FuelInjCkt_FA GetAIRR_b_AIR_Sys_FA GetOXYI_b_Bank1Snsr1_FA GetOXYI_b_Bank2Snsr1_FA GetEVPR_b_Purg1SlndCkt_FA GetEVPR_b_FlowDurNonPurg_FA GetEVPR_b_VentSlndCkt_FA GetEVPR_b_SmallLeak_FA GetEVPR_b_EmissionSys_FA GetEVPR_b_FTP_Circuit_FA	
	Clutch	Clutch	GetEPSR_b_CrankSnsr_FA GetVSPR_b_VehicleSpeedFA GetTOSR_b_TOS_Error GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktLo) GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktHi)	TransOutputSpeedSensor_Error
	Secondary Air	AIRR	GetAIRD_b_AIR_PresSensorFault GetDFIR_FaultActive(CeDFIR_e_AIR_SlndCktB1) GetDFIR_FaultActive(CeDFIR_e_AIR_PmpCktB1) GetMAFR_b_MAF_SnsrFA GetAAPR_e_AAP_DfltdStatus GetEITR_b_IAT_SnsrFA GetECTR_b_ECT_SnsrFA GetMSFR_b_EngMisfDtctd_FA GetCATR_b_CatSysEffLoB1_FA GetCATR_b_CatSysEffLoB2_FA GetMEMR_b_ECM_PCM_ProcPerf_FA GetVLTR_b_V5A_FA GetVLTR_b_V5B_FA GetSPKR_b_EST_DriverFltActive GetFULR_b_FuelInjCkt_FA	
		E85R	None	

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

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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		wheel speed sensor signal is missing or wheel speed sensor signal continuously indicates wheel speed too low. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation	> 40% disable codition(s):	Wheel Acceleration Vehicle speed No MIL Illuminated	> 3.13m/s/s > 9 mph C0035:18	Depends on driving condition 10s - 120s	
Right Front Wheel Speed Sensor Circuit	C0040 C0006	Sensor signal current out of range. Note : Failure limp is ABS/TCS and AYC are all disabled.	Sensor Signal Current Sensor Signal Current	< 4.5 mA ± 10% OR > 20 mA ± 10%	Supply Voltage level Supply Voltage level	< 18V > 10V	14 consecutive loops (140 ms)	Special Type C No MIL
Right Front Wheel Speed Sensor Circuit Range/ Performance	C0040 C0018 C005A C000F	wheel speed sensor signal changes erratically. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed acceleration	> 980.66m/s/s disable codition(s):	Vehicle speed	> 13mph C0040:0F	17 consecutive loops (170 ms)	Special Type C No MIL
		A failure at the fastest and the second-fastest wheel will be detected if the ratios of the corresponding wheels indicate a deviation bigger than the actual threshold value and smaller than value defined in the threshold. A failure at the slowest and the second-slowest wheel will be detected if the ratios of the corresponding wheels indicate a deviation smaller than the actual threshold value. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation Wheel speed signal deviation	> 25% < 150% disable codition(s):	Vehicle speed	> 13mph C0040:5A	Depends on driving condition 10s - 30s	
		Periodic drop of a wheel speed signal. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal	Np pulse disable codition(s):	Vehicle speed	> 13mph C0040:5A	15 consecutive wheel rotations	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		wheel speed sensor signal is missing or wheel speed sensor signal continuously indicates wheel speed too low. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation	> 40% disable codition(s):	Wheel Acceleration Vehicle Speed No MIL Illuminated	> 3.13m/s/s > 9 mph C0040:18	Depends on driving condition 10s - 120s	
Left Rear Wheel Speed Sensor Circuit	C0045 C0006	Sensor signal current out of range. Note : Failure limp is ABS/TCS and AYC are all disabled.	Sensor Signal Current Sensor Signal Current	< 4.5 mA ± 10% OR > 20 mA ± 10%	Supply Voltage level Supply Voltage level	< 18V > 10V	14 consecutive loops (140 ms)	Special Type C No MIL
Left Rear Wheel Speed Sensor Circuit Range/ Performance	C0045 C0018 C005A C000F	wheel speed sensor signal changes erratically. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed acceleration	> 980.66m/s/s disable codition(s):	Vehicle speed	> 13mph C0045:0F	17 consecutive loops (170 ms)	Special Type C No MIL
		A failure at the fastest and the second-fastest wheel will be detected if the ratios of the corresponding wheels indicate a deviation bigger than the actual threshold value and smaller than value defined in the threshold. A failure at the slowest and the second-slowest wheel will be detected if the ratios of the corresponding wheels indicate a deviation smaller than the actual threshold value. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation Wheel speed signal deviation	> 25% < 150% disable codition(s):	Vehicle speed	> 13mph C0045:5A	Depends on driving condition 10s - 30s	
		Periodic drop of a wheel speed signal. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal	No pulses disable codition(s):	Vehicle speed	> 13mph C0045:5A	15 consecutive wheel rotations	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		wheel speed sensor signal is missing or wheel speed sensor signal continuously indicates wheel speed too low. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation	> 40% disable codition(s):	Wheel Acceleration Vehicle speed No MIL Illuminated	> 3.13m/s/s > 9 mph C0045:18	Depends on driving condition 10s - 120s	
Right Rear Wheel Speed Sensor Circuit	C0050 C0006	Sensor signal current out of range. Note : Failure limp is ABS/TCS and AYC are all disabled.	Sensor Signal Current Sensor Signal Current	< 4.5 mA ± 10% OR > 20 mA ± 10%	Supply Voltage level Supply Voltage level	< 18V > 10V	14 consecutive loops (140 ms)	Special Type C No MIL
Right Rear Wheel Speed Sensor Circuit Range/ Performance	C0050 C0018 C005A C000F	wheel speed sensor signal changes erratically. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed acceleration	> 980.66m/s/s disable codition(s):	Vehicle speed	> 13mph C0050:0F	17 consecutive loops (170 ms)	Special Type C No MIL
		A failure at the fastest and the second-fastest wheel will be detected if the ratios of the corresponding wheels indicate a deviation bigger than the actual threshold value and smaller than value defined in the threshold. A failure at the slowest and the second-slowest wheel will be detected if the ratios of the corresponding wheels indicate a deviation smaller than the actual threshold value. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation Wheel speed signal deviation	> 25% < 150% disable codition(s):	Vehicle speed	> 13mph C0050:5A	Depends on driving condition 10s - 30s	
		Periodic drop of a wheel speed signal. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal	No pulses disable codition(s):	Vehicle speed	> 13mph C0050:5A	15 consecutive wheel rotations	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		wheel speed sensor signal is missing or wheel speed sensor signal continuously indicates wheel speed too low. Note : Failure limp is ABS/TCS and AYC are all disabled.	Wheel speed signal deviation	> 40% disable codition(s):	Wheel Acceleration Vehicle speed No MIL Illuminated	> 3.13m/s/s > 9mph C0050:18	Depends on driving condition 10s - 120s	
RAM Fault	C056D C0500	RAM data corrupt. The word from the RAM cells is read and buffered. This value is inverted and written back in RAM. This inverted value is read back and inverted again and then compared with the original value stored in the Buffer. The failure is set if the double inverted word does not match the original one. Only monitored once at startup/reset Note : Fail limp mode is EBD/ABS/TCS and AYC are all disabled	Read RAM	≠ Value written in RAM	NA		Used RAM in bytes * 10ms Note : Only at start up	Special Type C No MIL
ROM Fault	C056D C0500	a) A failure is detected if the calculated ROM code parity and the parity value stored in the parity memory do not match. Note: Fail limp mode is: EBD/ABS/TCS and AYC are all disabled	Calculated ROM parity	≠ Stored parity in memory	NA	always enabled	1 loop (10 ms)	Special Type C No MIL
		b) The Mcu stores an intentional error in the parity within the parity memory cell. The failure is set if the parity compare unit does not catch this intentional error. Note: Fail limp mode is: EBD/ABS/TCS and AYC are all disabled	Calculated ROM parity	≠ Stored parity in memory	NA	always enabled	1 loop (10 ms)	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
EEPROM Fault	C056D C0500	Several 32 bit CRC checksum values for the ROM regions are calculated during the code generation and stored in the ROM area.Cyclic, these 32 bits CRC checksums are calculated by a special hardware circuit and checked against the stored values by the MCU. A failure is detected if the checksums differ. This check is done for multiple cells. Note : Fail limp mode is: EBD/ABS/TCS and AYC are all disabled	Calculated checksum	# Stored checksum	NA	always enabled	10 ms	Special Type C No MIL
PCU Watchdog Failure		a) The Mcu calculates a watchdog word every loop and sends it to the PCU.The PCU verifies content and timing for this.The failure is detected by PCU if this word is incorrect	Calculated watchdog word	≠ sent watchdog word	NA	always enabled	one loop (10 ms)	
		b) The watchdog monitoring function within the PCU is checked once after power on. The Mcu generates intentional errors in the watchdog word and timing. A failure is set if the PCU fails to recognize this intentional error. EBD/ABS/TCS and AYC are all disabled	Calculated watchdog word	≠ sent watchdog word	NA	always enabled	one loop (10 ms)	
Loop Time Failure	C056D C0500	Runtime of controller loop is too long. Note: Failure limp mode is : EBD/ABS/TCS and AYC are all disabled	Program runtime /execution time	> 10 ms	NA	always enabled	10 ms	Special Type C No MIL

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Module Undervoltage	C0803	Module supply voltage low	Supply voltage to the module in V	a) First level : 9.7V +/- 0.3V b) Second level : 8.0V +/- 0.45V	Vehicle Speed Engine cranking information Engine rpm	> 10 kph is True >360 rpm	350 ms - 5000 ms	Special Type C No MIL
Module Overvoltage	C0807	Module supply voltage high	Supply voltage to the module in V	18.0 v +/- 1.0V	NA	always enabled	10ms	Special Type C No MIL

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel Rail Pressure (FRP) Sensor Performance (rationality)	P018B	This DTC detects 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			Frequency: Continuous; 12.5 ms loop. 60 seconds between intrusive tests that pass Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec period); otherwise report pass	DTC Type A 1 trip
					1. FRP Circuit Low DTC (P018C)	not active		
					2. FRP Circuit High DTC (P018D)	not active		
					3. FuelPump Circuit Low DTC (P0231)	not active	Duration of intrusive test is fueling related (5 to 12 seconds).	
					4. FuelPump Circuit High DTC (P0232)	not active		
					5. FuelPump Circuit Open DTC (P023F)	not active	Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	
					6. Reference Voltage DTC (P0641)	not active		
					7. Fuel Pump Control Module Driver Over-temperature DTC's (P064A, P1255)	not active		
					8. Control Module Internal Performance DTC (P0606)	not active		
					9. Engine run time	>=5 seconds		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					10. Emissions fuel level (PPEI $3FB) AND Engine Run Time 11. Fuel pump control 12. Fuel pump control state 13. Engine fuel flow 14. ECM fuel control system failure (PPEI $1ED)	not low > 30 sec enabled normal or FRP Rationality control > 0.047 g/s failure has not occurred		
Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage	P018C	This DTC detects if the fuel pressure sensor circuit is shorted to low	FRP sensor voltage	< 0.14 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
Fuel Rail Pressure (FRP) Sensor Circuit High Voltage	P018D	This DTC detects if the fuel pressure sensor circuit is shorted to high	FRP sensor voltage	> 4.86 V	Ignition	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
Fuel Pump Control Circuit Low Voltage	P0231	This DTC detects if the fuel pump control circuit is shorted to low	Fuel Pump Current	> 14.48A	Ignition OR HS Comm OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank 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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current AND Fuel Pump Duty Cycle	<=0.5A □ > 20%	Ignition OR HS Comm OR Fuel Pump Control AND Ignition Run/Crank voltage	Run or Crank Enabled Enabled 9V <voltage< 32V	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip
Fuel System Control Module Enable Control Circuit	P025A	This DTC detects if there is a fault in the fuel pump control enable circuit	PPEI (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	Frequency: Once at power-up	DTC Type A 1 trip

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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			1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
					Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	Frequency: Runs continuously in the background.	
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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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 OR Reference voltage AND Output	>= 0.5V inactive . >= 5.5V active <= 4.5V active	Ignition	Run or Crank	15 failures out of 20 samples 1 sample/12.5 ms	DTC Type A 1 trip
			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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel Pump Control Module - Driver Over-temperature 2	P1255	This DTC detects if an internal fuel pump driver overtemperature condition exists under extreme operating conditions (GM's responsibility)	Module Range of Operation	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.)	Ignition OR HS Comm OR Fuel Pump Control AND Ignition Run / Crank	Run or Crank Enabled Enabled 9V<voltage<32V	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
			AND Fuel pump driver Temp	> 190C	KeFRPD_b_FPOverTempDiagEnbl	TRUE		
Ignition 1 Switch Circuit Low Voltage	P2534	This DTC detects if the Ignition1 Switch circuit is shorted to low or open	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip
Fuel Pump Flow Performance (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 (P064A, P1255)	not active		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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		
					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