COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Intake Camshaft Actuator Solenoid Circuit – Bank 1	P0010	Detects a VVT system error by monitoring the circuit for electrical integrity	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		System supply voltage is within limits Output driver is commanded on, Ignition switch is in crank or run position	> 11 Volts, and < 32 Volts	20 failures out of 25 samples 250 ms /sample, continuous	Type B 2 trips
Intake Camshaft System Performance – Bank 1	P0011	Detects a VVT system error by comparing the desired and actual cam positions when VVT is activated	Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive	(Intake cam Bank 1)Cam Position Error > KtPHSD_phi_CamPosErrorLimIc1 Deg (see Supporting Table)	The following DTC's are NOT active: P0010 IntkCMP B1 Circuit P0340, P0341, Intake B1 Cam sensors P0335, P0336, Crank sensors P0016, P0017, P0018, P0019 Cam to crank rationality Engine is running VVT is enabled Desired camshaft position > 0 Power Take Off (PTO) not active	System Voltage > 11 Volts, and System Voltage < 32 Volts Both Desired & Measured cam positions cannot be < KtPHSD_phi_CamPos ErrorLimIc1 or > than (25.0 - KtPHSD_phi_CamPos ErrorLimIc1). Desired cam position cannot vary more than 4.5 Cam Deg for at least KtPHSD_t_StablePositi	**50** 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 **4.5** Cam Deg for at least KtPHSD_t_StablePositi onTimeEc1 seconds (see Supporting Tables) 100 ms /sample	**100** failures out of **300** samples	Type B 2 trips
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 2 Sensor A	P0018	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 2 sensor A occurs during the incorrect crank position	2 cam sensor pulses more than -11 crank degrees before or 13 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 P0345, P0346 5VoltReferenceA FA 5VoltReferenceB FA < 30.0 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
~~Crankshaft – Sprocket Correlation~~	**P0016** and P0017	~~On engines with a dual intermediate sprocket between the crankshaft and the camshafts, this~~	~~Bank 1 Cam Sensor A pulses more than 6 crank degrees before or 9 crank degrees after~~		~~Crankshaft and camshaft position signals are synchronized~~		~~2 failures out of 3 tests. A failed test is **1 out of 10**~~	~~Type B 2 trips~~

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
~~Diagnostic~~		~~crankshaft and the camshafts, this diagnostic detects a timing misalignment between the crankshaft, sprocket and camshafts that will cause the bank 1 camshafts to be misaligned.~~	~~before or 9 crank degrees after nominal position in one cam revolution.~~ ~~+~~ ~~Bank 1 Cam Sensor B pulses more than 6 crank degrees before or 9 crank degrees after nominal position in one cam revolution.~~	~~>= 16~~	~~Engine is Spinning~~ ~~Cam phaser is in "parked" position~~ ~~No Active DTCs:~~	~~P0335, P0336~~ ~~P0340, P0341~~ ~~P0365, P0366~~ ~~5VoltReferenceA_FA~~ ~~5VoltReferenceB_FA~~	~~is 4 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~~ ~~One sample per cam rotation~~	
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 Sensor A	**P0016**	**Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 1 sensor A occurs during the incorrect crank position**	**2 cam sensor pulses more than 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** **< 30.0 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**
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**	**2 cam sensor pulses more than 10 crank degrees before or 13 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**		**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**	**Type B 2 trips**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No Active DTCs: Time since last execution of diagnostic	P0335, P0336 P0365, P0366 5VoltReferenceA_FA 5VoltReferenceB_FA < 30.0 seconds	to the park position. This time is defined by the table "Cam Correlation Oil Temperature Threshold". One sample per cam rotation	
Crankshaft - Sprocket Correlation Diagnostic	P0018 and P0019	On engines with a dual intermediate sprocket between the crankshaft and the camshafts, this diagnostic detects a timing misalignment between the crankshaft, sprocket and camshafts that will cause the bank 2 camshafts to be misaligned.	Bank 1 Cam Sensor B pulses more than -6 crank degrees before or 9 crank degrees after nominal position in one cam revolution. + Bank 2 Cam Sensor B pulses more than -7 crank degrees before or 9 crank degrees after nominal position in one cam revolution.	>= 16	Crankshaft and camshaft position signals are synchronized Engine is Spinning Cam phaser is in "parked" position No Active DTCs:	P0335, P0336 P0345, P0346 P0390, P0391 5VoltReferenceA_FA 5VoltReferenceB_FA	2 failures out of 3 tests. A failed test is 1 out of 10 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
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 2 Sensor B	P0019	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 2 sensor B occurs during the incorrect crank position	2 cam sensor pulses more than 9 crank degrees before or 11 crank degrees after nominal position in one cam revolution.		Crankshaft and camshaft position signals are synchronized Engine is Spinning Cam phaser is in "parked" position No Active DTCs:	P0335, P0336 P0390, P0391 5VoltReferenceA_FA	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. There is a delay after the first failed test to allow the camshaft position to return to the park position. This time is defined by	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time since last execution of diagnostic	5VoltReferenceB_FA < 30.0 seconds	the table "Cam Correlation Oil Temperature Threshold". One sample per cam rotation	
Intake Camshaft Actuator Solenoid Circuit – Bank 2	P0020	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 2	P0021	Detects a VVT system error by comparing the desired and actual cam positions when VVT is activated	Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive	(Intake cam Bank 2)Cam Position Error > KtPHSD_phi_CamPosErrorLimIc2 Deg (see Supporting Table)	The following DTC's are NOT active: P0020 IntkCMP B2 Circuit P0345, P0346, Intake B2 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_CamPosErrorLimIc2 or > than (25.0 - KtPHSD_phi_CamPosErrorLimIc2). Desired cam position cannot vary more than 4.5 Cam Deg for at least KtPHSD_t_StablePositionTimeIc2 seconds (see Supporting	50 failures out of 150 samples 100 ms /sample	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 Actuator Solenoid Circuit – Bank 2	**P0023**	**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**
Exhaust Camshaft System Performance – Bank 2	**P0024**	**Detects a VVT system error by comparing the desired and actual cam positions when VVT is activated**	**Camshaft position error [absolute value of (desired position - actual position)] is compared to thresholds to determine if excessive**	**(Exhaust cam Bank 2)Cam Position Error > KtPHSD_phi_CamPosErrorLimEc2 Deg (see Supporting Table)**	**The following DTC's are NOT active:** **P0023 ExhCMP B2 Circuit** **P0390, P0391, Exh B2 Cam sensors** **P0335, P0336, Crank sensors** **P0016, P0017, P0018, P0019 Cam to crank rationality**	**System Voltage > 11 Volts, and** **System Voltage < 32 Volts** **Both Desired & Measured cam positions cannot be < KtPHSD_phi_CamPosErrorLimEc2 or > than (Exh25.0 - KtPHSD_phi_CamPosErrorLimEc2).** **Desired cam position cannot vary more than 4.5 Cam Deg for at least KtPHSD_t_StablePositionTimeEc2 seconds (see Supporting Tables)**	**100 failures out of 300 samples**	**Type B** **2 trips**
					Engine is running **VVT is enabled** **Desired camshaft position > 0** **Power Take Off (PTO) not active**		**100 ms /sample**	
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	P0036	This DTC checks the Heater Output Driver circuit for electrical	Voltage low during driver open state (indicates short-to-ground or		Ign Switch position	= Crank or Run position	20 failures out of 25 samples	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Circuit Bank 1 Sensor 2		integrity.	open circuit) or voltage high during driver closed state (indicates short to voltage).		Ignition Voltage Engine Speed	11.0 volts < Ign Voltage < 32.0 volts > 400 RPM	250 ms /sample Continuous	
O2S Heater Control Circuit Bank 2 Sensor 1	**P0050**	**This DTC checks the Heater Output Driver circuit for electrical integrity.**	**Voltage low during driver open state (indicates short-to-ground or open circuit) or voltage high during driver closed state (indicates short to voltage).**		**Ign Switch position** **Ignition Voltage** **Engine Speed**	**= Crank or Run position** **11.0 volts < Ign Voltage < 32.0 volts** **> 400 RPM**	**20 failures out of 25 samples** **250 ms /sample** **Continuous**	**2 trips Type B**
HO2S Heater Resistance Bank 1 Sensor 1	P0053	Detects an oxygen sensor heater having an incorrect or out of range resistance value.	Learned Heater Resistance.	Calculated Heater Resistance < 5.5 ohms -OR- Calculated Heater Resistance > 12.8 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 < 0.025 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 < 5.5 ohms -OR- Calculated Heater Resistance > 12.8 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 < **0.050** seconds	Once per valid cold start	2 trips Type B
O2S Heater Control Circuit Bank 2 Sensor 2	**P0056**	**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**	**= Crank or Run position** **11.0 volts < Ign Voltage < 32.0 volts**	**20 failures out of 25 samples**	**2 trips Type B**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Speed	> 400 RPM	250 ms /sample Continuous	
HO2S Heater Resistance Bank 2 Sensor 1	**P0059**	**Detects an oxygen sensor heater having an incorrect or out of range resistance value.**	**Learned Heater Resistance.**	**Calculated Heater Resistance < 5.5 ohms -OR- Calculated Heater Resistance > 12.8 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 < 0.025 seconds**	**Once per valid cold start**	**2 trips Type B**
HO2S Heater Resistance Bank 2 Sensor 2	**P0060**	**Detects an oxygen sensor heater having an incorrect or out of range resistance value.**	**Learned Heater Resistance.**	**Calculated Heater Resistance < 0.0 ohms -OR- Calculated Heater Resistance > 0.0 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 < 0.050 seconds**	**Once per valid cold start**	**2 trips Type B**
MAP / MAF / Throttle Position Correlation	P0068	Detect when MAP and MAF do not match estimated engine airflow as established by the TPS	1) Difference between MAP and estimated MAP exceeds threshold (kPa), or P0651 (5 Volt Ref), or P0107 (MAP circuit low), or P0108 (MAP circuit high) have failed this key cycle, then MAP portion of diagnostic fails	Table, f(TPS). See supporting tables	Engine Speed	> 800 RPM Run/Crank voltage or Powertrain relay voltage > **6.00** and reduced power is false, else the failure will be reported for all conditions	Continuously fail MAP and MAF portions of diagnostic for 0.1875 s	Type: A MIL: YES Trips:

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							Continuous in MAIN processor	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				
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	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.
					Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active			
High Pressure Pump Cntrl Solenoid Enable Low Side Open Circuit	P0090	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the high pressure fuel pump solenoid low side is open circuit		Engine Speed 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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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 <= **65** All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT, IAT2 and ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail	Pressure Fall Test: Injected cylinder events >= Supporting Table KtFHPD_Cnt_HPS_PressFallLoThrsh Pressure Rise Test: Time >= Supporting Table KtFHPC_t_HighPressStartTmout	2 trips Type B
					For each engine start, only 1 diagnostic is performed. The pressure rise test will run if HIgh side fuel pressure is less than KtFHPC_p_HighPressStart, otherwise, the pressure fall diagnostic will run The pressure fall runs when the engine is cranking	Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement 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.
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
Mass Air Flow System Performance (naturally aspirated)	P0101	Determines if the MAF sensor is stuck within the normal operating range	Filtered Throttle Model Error AND ABS(Measured Flow – Modeled Air Flow) Filtered AND ABS(Measured MAP – MAP Model 2) Filtered	<= 350 kPa*(g/s) > 16 grams/sec > 20.0 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 >= **-7** Deg C <= **127** 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	Continuous Calculation are performed every 12.5 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No Active DTCs:	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		
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	<= 500 Hertz (~ 0.9 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> **0.0** seconds >= 300 RPM >= **8.0** Volts >= 1.0 seconds	300 failures out of 375 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	>= 14500 Hertz (~ 425 gm/sec)	Engine Run Time Engine Speed Ignition Voltage Above criteria present for a period of time	> **0.0** seconds >= 300 RPM >= **8.0** Volts >= 1.0 seconds	300 failures out of 375 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	<= 350 kPa*(g/s) > 20.0 kPa > 20.0 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 >= **-7** Deg C <= **127** Deg C >= -20 Deg C <= 125 Deg C >= 0.00 Filtered Throttle Model Error multiplied by TPS Residual Weight Factor MAP Model 1 multiplied by MAP1 Residual	Continuous Calculations are performed every 12.5 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						Weight Factor based on RPM MAP Model 2 multiplied by MAP2 Residual Weight Factor based on RPM See table "IFRD Residual Weighting Factors".		
					No Active DTCs:	MAP_SensorCircuitFA EGRValve_FP EGRValvePerformance_FA MAF_SensorCircuitFA CrankSensor_FA ECT_Sensor_FA ECT Sensor Ckt FP IAT SensorFA IAT SensorCircuitFP		
			<u>Engine Not Rotating Case:</u> Manifold Pressure OR Manifold Pressure	 < 50.0 kPa > **115.0** kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	 > **409.6** seconds EngModeNotRunTmErr MAP_SensorFA AAP_SnsrFA_NA MAP_SensorCircuitFP AAP_SnsrCktFP_NA	999 failures out of 0 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	P0108	Detects an open sensor ground or continuous short to high in either	MAP Voltage	> 90.0 % of 5 Volt Range (4.5 Volts = 115.0 kPa)	Continuous		320 failures out of 400 samples	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Pressure Sensor Circuit High		the signal circuit or the MAP sensor.					1 sample every 12.5 msec	
Intake Air Temperature Sensor Circuit Performance	**P0111**	**Detects an IAT sensor that has stuck in range by comparing to IAT2 and engine coolant temperature at startup**	**ABS(Power Up IAT - Power Up IAT2)** **AND** **ABS(Power Up ECT – Power Up IAT) > ABS(Power Up ECT – Power Up IAT2)**	**> 20 deg C**	**Time between current ignition cycle and the last time the engine was running** **No Active DTCs:**	**> 28800 seconds** **ECT_Sensor_Ckt_FA** **IAT_SensorCircuitFA** **IAT2_SensorCircuitFA**	**Executes once at the beginning of each ignition cycle if enable conditions are met**	**Type B 2 trips**
Intake Air Temperature Sensor Circuit Low (High Temperature)	P0112	Detects a continuous short to ground in the IAT signal circuit or the IAT sensor	Raw IAT Input	**< 48** Ohms (~150 deg C)	Engine Run Time	> 0.0 seconds	**40** failures out of **50** 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	> **281292** Ohms (~-60 deg C)	Engine Run Time	> 0.0 seconds	**40** failures out of **50** samples 1 sample every 100 msec	Type B 2 trips
Intake Air Temperature Sensor Intermittent In-Range	P0114	Detects a noisy or erratic IAT signal circuit or IAT sensor	Change in IAT reading between consecutive 100 millisecond samples Change in IAT is multiplied by IAT Intermittent Weight Factor based on Filtered IAT. Filtered IAT = 0.10 * Current IAT + 0.90 * Filtered IAT from 100 milliseconds before	> 10 DegC	Continuous		20 failures out of 200 samples 1 sample every 100 msec	Type B 2 trips
Engine Coolant Temperature (ECT) Sensor Performance	P0116	This DTC detects ECT temp sensor stuck in mid range.	A failure will be reported if any of the following occur:		No Active DTC's	VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_Ckt_FA IgnitionOffTimeValid	1 failure 500 msec/sample	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			1) ECT at power up > IAT at power up by an IAT based table lookup value after a minimum **36000** second soak (fast fail).	See "P0116: Fail if power up ECT exceeds IAT by these values" in the Supporting tables section		TimeSinceEngineRunningValid	Once per valid cold start	
					Non-volatile memory initization	= Not occurred		
					Test complete this trip	= False		
					Test aborted this trip	= False		
			2) ECT at power up > IAT at power up by **15.0** C after a minimum **36000** second soak and a block heater has not been detected.		IAT	≥ -7 ºC		
					LowFuelCondition Diag	= False		
					Block Heater detection is enabled when either of the following occurs:			
					1) ECT at power up > IAT at power up by	> 15.0 ºC		
			3) ECT at power up > IAT at power up by **15.0** C after a minimum **36000** seconds soak and the time spent cranking the engine without starting is greater than 10.0 seconds with the Low Fuel Condition Diag		2) Cranking time	< 10.0 Seconds		
					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	> 400 Seconds with		
					1b) Vehicle speed	> 14.9 MPH		
				= False	1c) Additional Vehicle drive time is provided to 1a when Vehicle speed is below 1b as follows:	**0.00** times the seconds with vehicle speed below 1b		
					1d) IAT drops from power up IAT	≥ **8.0** ºC		
					2a) ECT drops from power up ECT	> **256** ºC Within		
					2b) Engine run time	> **0** Seconds		
					3) Engine run time with vehicle speed below 1b	> 1800 Seconds		
					4) Minimum IAT during test	≤ -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	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Low							1 sec/sample Continuous	
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)	> **300000** 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	> **350** kPa*(g/s) > **16** grams/sec <= **20.0** 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 **> -7 Deg C** < 127 Deg C > -20 Deg C < 125 Deg C >= 0.00 Filtered Throttle Model Error Error multiplied by TPS Residual Weight Factor based on RPM Modeled Air Flow Error multiplied by MAF Residual Weight Factor based on RPM and MAF Residual Weight Factor Based on MAF Est See table "IFRD Residual Weighting Factors". MAP_SensorCircuitFA EGRValve_FP EGRValvePerformance_FA MAF_SensorCircuitFA	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.
						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 > **6.00** and reduced power is false, else the failure will be reported for all conditions No 5V reference error for #4 5V reference circuit No P06A3	79/159 counts; 57 counts continuous; 3.125 msec /count in the ECM main processor	Type: A MIL: YES Trips: 1
TPS1 Circuit High	P0123	Detects a continuous or intermittent short or open in TPS1 circuit	TPS1 Voltage >	4.75		Run/Crank voltage or Powertrain relay voltage > 6.00 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 55.0 °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 ≥ **120** 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 **Range #2 (Alternate) Test** ECT at start run Average Airflow Vehicle speed **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 Diagnostic will restart (using the lower value) if ECT drops	≥ **5.0** gps > 5 mph for at least **1.5** miles ≤ **50.0** °C ≥ **5.0** gps > 5 mph for at least **1.5** miles **45.0** gps < **13.0** gps 50.00% 1.00 times 1.00 grams each second ≥ 100.0°C below previous min ECT		
O2S Circuit Low Voltage Bank 1 Sensor 1	P0131	This DTC determines if the O2 sensor circuit is shorted to low.	Measure Oxygen Sensor Signal.	Oxygen Sensor signal is < 50 mvolts	No Active DTC's	TPS_ThrottleAuthority Defaulted MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA	380 failures out of 475 samples Frequency: Continuous in 100 milli - second loop	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						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	**0.9805** ≤ equiv. ratio ≤ **1.0195**		
					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	> **3.0** seconds		
O2S Circuit High Voltage Bank 1 Sensor 1	P0132	This DTC determines if the O2 sensor circuit is shorted to high.	Measure Oxygen Sensor Signal.	Oxygen Sensor signal is > 1050 mvolts	**Open Test Criteria**		100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	2 trips Type B
					No Active DTC's	TPS_ThrottleAuthority Defaulted MAF_SensorFA EthanolCompositionSensor_FA		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					AFM Status	= All Cylinders active		
					Heater Warm-up delay	= Complete		
					Engine Run Time	> 5 seconds		
					Engine Run Accum	> 150 seconds		
					Fuel Condition	<= 87 % Ethanol		
					No Active DTC's	MAP_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						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		
					Equivalence Ratio	**0.9805** ≤ equiv. ratio ≤ **1.0195**		
					Air Per Cylinder	50 ≤ APC ≤ 500 mgrams		
					Fuel Control State	not = Power Enrichment		
					All of the above met for Time	> **3** 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 IAT_SensorFA MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA EthanolCompositionSensor_FA EngineMisfireDetected_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	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Bank 1 Sensor 1 DTC's not active	= P0131, P0132 or P0134	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	
					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	>= **60** seconds		
					Learned Htr resistance	= Valid		
					Engine Coolant	> **65** ºC		
					IAT	> -40 ºC		
					Engine run Accum	> **60** seconds		
					Time since any AFM status change	> **0.0** seconds		
					Time since Purge On to Off change	> **4.0** seconds		
					Time since Purge Off to On change	> **4.0** seconds		
					Purge duty cycle	>= 0 % duty cycle		
					Engine airflow	**15** gps <= engine airflow <= **55** gps		
					Engine speed	1000 <= RPM <= 3300		
					Fuel	< 87 % Ethanol		
					Baro	> 70 kpa		
					Air Per Cylinder	>= **125** 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 not = Power		
					Fuel Control State	Enrichment		
					Fuel State	DFCO not active		
					Commanded Proportional Gain	>= 0.0 %		
					All of the above met for Time	> **2.0** 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	**100** failures out of **125** samples.	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Bank 1 Sensor 1						EthanolCompositionSensor_FA	Frequency: Continuous	
					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		
					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 > 1.2 amps	No Active DTC's	ECT_Sensor_FA	8 failures out of 10 samples	2 trips Type B
					System Voltage	10.0 volts < system voltage< 32.0 volts	Frequency: 2 tests per trip	
					Heater Warm-up delay	= Complete	10 seconds delay between tests and 1 second execution rate	
					O2S Heater device control	= Not active		
					B1S1 O2S Heater Duty Cycle	> zero		
					All of the above met for			
					Time	> 120 seconds		
O2S Circuit Low Voltage Bank 1 Sensor 2	P0137	This DTC determines if the O2 sensor circuit is shorted to low.	Measure Oxygen Sensor Signal.	Oxygen Sensor signal is < 50 mvolts	No Active DTC's	TPS_ThrottleAuthority Defaulted MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA	430 failures out of 540 samples	2 trips Type B
					AIR intrusive test	= Not active	Frequency: Continuous in 100 milli - second loop	
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Low Fuel Condition Diag	= False		
					Equivalence Ratio	**0.9805** ≤ equiv. ratio ≤ **1.0195**		
					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	> **3.0** 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** No Active DTC's	TPS_ThrottleAuthority Defaulted MAF_SensorFA EthanolCompositionSensor_FA	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	2 trips Type B
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Initial delay after Open Test Criteria met (not cold start condition)	> 45.0 seconds when engine soak time ≤ 28800 seconds		
					Equivalence Ratio	**0.9805** ≤ equiv. ratio ≤ **1.0195**		
					Air Per Cylinder	50 ≤ APC ≤ 500 mgrams		
					Fuel Control State	not = Power Enrichment		
					All of the above met for Time	> **3** seconds		
O2 Sensor Slow Response Rich to Lean Bank 1 Sensor 2	P013A	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Rich to Lean voltages range during Rich to Lean transition. The diagnostic is an intrusive test which runs in a DFCO mode to achieve the required response.	The EWMA of the Post O2 sensor normalized integral value is greater than the threshold. OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds) is greater than the airflow threshold.	1) B1S2 EWMA normalized integral value > 8.0 units OR 2) Accumulated air flow during slow rich to lean test > 74 grams (upper threshold is 450 mvolts and lower threshold is 150 mvolts)	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = TRUE, multiple tests per trip are allowed	1 trips Type A EWMA
					B1S2 Failed this key cycle	P013B, P013E, P013F, P2270 or P2271		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria	
					ICAT MAT Burnoff delay	= Not Valid		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Green O2S Condition	= 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 Post fuel cell DTC's Passed DTC's Passed	= False = enabled = P2270 (and P2272 (if applicable)) = P013E (and P014A (if applicable))		
					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	1) B1S2 EWMA normalized integral value > 8.0 units OR 2) Accumulated air flow during slow lean to rich test > 75 grams (lower threshold is **350** 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	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid	1 trips Type A EWMA

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		threshold.	Response Test (between the lower and upper voltage thresholds) is greater than the airflow threshold.	upper threshold is 600 mvolts)		FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed	
					B1S2 Failed this key cycle	P013A, P013E, P013F, P2270 or P2271		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					ICAT MAT Burnoff delay	= Not Valid		
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Post fuel cell	= enabled		
					DTC's Passed	= P2270 (and P2272 (if applicable))		
					DTC's Passed	= P013E (and P014A (if applicable))		
					DTC's Passed	= P013A (and P013C (if applicable))		
					DTC's Passed	= P2271 (and P2273 (if applicable))		
					DTC's Passed	= P013F (and P014B (if applicable))		
					After above conditions are met: Fuel Enrich mode continued.			
O2 Sensor Slow Response Rich to Lean Bank 2 Sensor 2	**P013C**	**This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Rich to Lean voltages range during Rich to Lean transition. The diagnostic is an intrusive test which runs in a DFCO mode to achieve the required response.**	**The EWMA of the Post O2 sensor normalized integral value is greater than the threshold. OR The Accumulated mass air flow monitored during the Slow Response Test (between the upper and lower voltage thresholds) is greater than the**	**1) B1S2 EWMA normalized integral value > 8.0 units OR 2) Accumulated air flow during slow rich to lean test > 74 grams (upper threshold is 450 mvolts and lower threshold is 150 mvolts)**	**No Active DTC's**	**TPS_ThrottleAuthorityDefaulted 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_ResetFastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are**	**1 trips Type A EWMA**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			thresholds) is greater than the airflow threshold.			EngineMisfireDetected_FA EthanolCompositionSensor_FA	tests per trip are allowed	
					B2S2 Failed this key cycle	P013D, P014A, P014B, P2272 or		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					ICAT MAT Burnoff delay	= Not Valid		
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Post fuel cell	= enabled		
					DTC's Passed	= P2270 (and P2272 (if applicable))		
					DTC's Passed	= P013E (and P014A (if applicable))		
					After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).			
O2 Sensor Slow Response Lean to Rich Bank 2 Sensor 2	P013D	This DTC determines if the post catalyst O2 sensor has Slow Response in a predefined Lean to Rich voltages range during Lean to Rich transition. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required	The EWMA of the Post O2 sensor normalized integral value is greater than the threshold. OR The Accumulated mass air flow	1) B1S2 EWMA normalized integral value > 8.0 units OR 2) Accumulated air flow during slow lean to rich test > 75 grams (lower threshold is 350	No Active DTC's	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc= FALSE for the given Fuel Bank OR	1 trips Type A EWMA

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		rich threshold.	monitored during the Slow Response Test (between the lower and upper voltage thresholds) is greater than the airflow threshold.	mvolts and upper threshold is 600 mvolts)		FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	NaPOPD_b_RapidResponseActive = TRUE, multiple tests per trip are allowed	
					B2S2 Failed this key cycle	P013C, P014A, P014B, P2272 or P2273		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delav 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).	
					ICAT MAT Burnoff delay	= Not Valid		
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Post fuel cell	= enabled		
					DTC's Passed	= P2270 (and P2272 (if applicable))		
					DTC's Passed	= P013E (and P014A (if applicable))		
					DTC's Passed	= P013A (and P013C (if applicable))		
					DTC's Passed	= P2271 (and P2273 (if applicable))		
					DTC's Passed	= P013F (and P014B (if applicable))		
					After above conditions are met: Fuel Enrich mode continued.			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Note: This feature is only enabled when the vehicle is new and cannot be enabled in			
O2 Sensor Delayed Response Rich to Lean Bank 1 Sensor 2	P013E	This DTC determines if the post catalyst O2 sensor has an initial delayed response to an A/F change from Rich to Lean. The diagnostic is an intrusive test which runs in a DFCO mode to achieve the required response.	Post O2 sensor cannot go below the threshold voltage. AND The Accumulated mass air flow monitored during the Delayed Response Test is greater than the threshold.	1) Post O2S signal > 450 mvolts AND 2) Accumulated air flow during stuck rich test > **40** grams.	No Active DTC's B1S2 Failed this key cycle System Voltage Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell DTC's Passed After above conditions are met: DFCO mode entered (wo driver initiated pedal input).	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 = Valid = Not Valid = Not Valid = False = enabled = P2270 and P2272 (if applicable)	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = TRUE, multiple tests per trip are allowed <u>Green Sensor Delay Criteria</u> The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							enabled in service	
O2 Sensor Delayed Response Lean to Rich Bank 1 Sensor 2	P013F	This DTC determines if the post catalyst O2 sensor has an initial delayed response to an A/F change from Lean to Rich. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	Post O2 sensor cannot go above the threshold voltage. AND The Accumulated mass air flow monitored during the Delayed Response Test is greater than the threshold.	1) Post O2S signal < **350** mvolts AND 2) Accumulated air flow during lean to rich test > 110 grams.	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = TRUE, multiple tests per trip are allowed	2 trips Type B
					B1S2 Failed this key cycle	P013A, P013B, P013E, P2270 or P2271		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	<u>Green Sensor Delay Criteria</u> The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					ICAT MAT Burnoff delay	= Not Valid		
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Post fuel cell	= enabled		
					DTC's Passed	= P2270 (and P2272 (if applicable))		
					DTC's Passed	= P013E (and P014A (if applicable))		
					DTC's Passed	= P013A (and P013C (if applicable))		
					DTC's Passed	= P2271 (and P2273 (if applicable))		
					After above conditions are met: Fuel Enrich mode entered.			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2S Circuit Insufficient Activity Bank 1 Sensor 2	P0140	This DTC determines if the O2 sensor circuit is open.	Measure Oxygen Sensor Signal.	1700 mvolts < Oxygen Sensor signal	No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel	TPS_ThrottleAuthority Defaulted MAF_SensorFA EthanolCompositionSensor_FA 10.0 volts < system voltage< 32.0 volts = All Cylinders active = Complete > 5 seconds > 150 seconds <= 87 % Ethanol	**100** failures out of **125** samples. Frequency: Continuous 100msec loop	2 trips Type B
O2S Heater Performance Bank 1 Sensor 2	P0141	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	Measured Heater Current.	Measured Heater current < 0.3 amps -OR- Measured Heater current > **1.2** 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 **10** seconds delay between tests and 1 second execution rate	2 trips Type B
O2 Sensor Delayed Response Rich to Lean Bank 2 Sensor 2	**P014A**	**This DTC determines if the post catalyst O2 sensor has an initial delayed response to an A/F change from Rich to Lean. The diagnostic is an intrusive test which runs in a DFCO mode to achieve the required response.**	**Post O2 sensor cannot go below the threshold voltage.** **AND** **The Accumulated mass air flow monitored during the Delayed Response Test is greater than the threshold.**	**1) Post O2S signal > 450 mvolts** **AND** **2) Accumulated air flow during stuck rich test > 40 grams.**	**No Active DTC's** **B2S2 Failed this key cycle**	**TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013C, P013D, P014B, P2272 or P2273**	**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 Learned heater resistance ICAT MAT Burnoff delay Green O2S Condition Low Fuel Condition Diag Post fuel cell DTC's Passed After above conditions are met: DFCO mode entered (wo driver initiated pedal input).	10.0 volts < system voltage< 32.0 volts = Valid = Not Valid = Not Valid = False = enabled = P2270 and P2272 (if applicable)	Green Sensor Delay Criteria The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
O2 Sensor Delayed Response Lean to Rich Bank 2 Sensor 2	P014B	This DTC determines if the post catalyst O2 sensor has an initial delayed response to an A/F change from Lean to Rich. The diagnostic is an intrusive test which increases the delivered A/F ratio to achieve the required rich threshold.	Post O2 sensor 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 < 350 mvolts AND 2) Accumulated air flow during lean to rich test > 110 grams.	No Active DTC's	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA	Frequency: Once per trip Note: if NaPOPD_b_ResetFastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive=	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	TRUE, multiple tests per trip are allowed	
					B2S2 Failed this key cycle	P013C, P013D, P014A, P2272 or P2273		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	<u>Green Sensor Delay Criteria</u> The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					ICAT MAT Burnoff delay	= Not Valid		
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Post fuel cell	= enabled		
					DTC's Passed	= P2270 (and P2272 (if applicable))		
					DTC's Passed	= P013E (and P014A (if applicable))		
					DTC's Passed	= P013A (and P013C (if applicable))		
					DTC's Passed	= P2271 (and P2273 (if applicable))		
					After above conditions are met: Fuel Enrich mode entered.			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
O2S Circuit Low Voltage Bank 2 Sensor 1	P0151	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_ThrottleAuthorityDefaulted MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA	380 failures out of 475 samples Frequency: Continuous in 100 milli - second loop	2 trips Type B
					AIR intrusive test	= Not active		
					Fuel intrusive test	= Not active		
					Idle intrusive test	= Not active		
					EGR intrusive test	= Not active		
					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	0.9805 ≤ equiv. ratio ≤ 1.0195		
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					All of the above met for Time	> 3.0 seconds		
O2S Circuit High Voltage Bank 2 Sensor 1	P0152	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 Frequency: Continuous in 100 milli - second loop	2 trips Type B
					No Active DTC's	TPS_ThrottleAuthorityDefaulted MAF_SensorFA EthanolCompositionSensor_FA		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					AFM Status	= All Cylinders active		
					Heater Warm-up delay	= Complete		
					Engine Run Time	> 5 seconds		
					Engine Run Accum	> 150 seconds		
					Fuel Condition	<= 87 % Ethanol		
					No Active DTC's	MAP_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA		
					Low Fuel Condition Diag	= False		
					Fuel Condition	<= 87 % Ethanol		
					Initial delay after Open Test Criteria met (cold start condition)	> 105.0 seconds when engine soak time > 28800 seconds		
					Initial delay after Open Test Criteria met (not cold start condition)	> 105.0 seconds when engine soak time ≤ 28800 seconds		
					Equivalence Ratio	0.9805 ≤ equiv. ratio ≤ 1.0195		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Air Per Cylinder	50 ≤ APC ≤ 500 mgrams		
					Fuel Control State	not = Power Enrichment		
					All of the above met for Time	> 3 seconds		
O2S Slow Response Bank 2 Sensor 1	P0153	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 "P0153 - O2S Slow Response Bank 2 Sensor 1" Pass/Fail Threshold table in the Supporting Tables tab.		No Active DTC's	TPS_ThrottleAuthorityDefaulted MAP_SensorFA IAT_SensorFA ECT_Sensor_FA IAT_SensorFA MAF_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA EthanolCompositionSensor_FA EngineMisfireDetected_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 cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	2 trips Type B
					Bank 2 Sensor 1 DTC's not active	= P0151, P0152 or P0154		
					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	>= 60 seconds		
					Learned Htr resistance	= Valid		
					Engine Coolant	> 65 ºC		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					IAT	> -40 ºC		
					Engine run Accum	> 60 seconds		
					Time since any AFM status change	> 0.0 seconds		
					Time since Purge On to Off change	> 4.0 seconds		
					Time since Purge Off to On change	> 4.0 seconds		
					Purge duty cycle	>= 0 % duty cycle		
					Engine airflow	15 gps <= engine airflow <= 55 gps		
					Engine speed	1000 <= RPM <= 3300		
					Fuel	< 87 % Ethanol		
					Baro	> 70 kpa		
					Air Per Cylinder	>= 125 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 not = Power		
					Fuel Control State	Enrichment		
					Fuel State	DFCO not active		
					Commanded Proportional Gain	>= 0.0 %		
					All of the above met for Time	> 2.0 seconds		
O2S Circuit Insufficient Activity Bank 2 Sensor 1	P0154	This DTC determines if the O2 sensor circuit is open.	Measure Oxygen Sensor Signal.	1700 mvolts < Oxygen Sensor signal	No Active DTC's	TPS_ThrottleAuthorityDefaulted MAF_SensorFA EthanolCompositionSensor_FA	100 failures out of 125 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		
					Fuel	<= 87 % Ethanol		
O2S Heater Performance Bank 2 Sensor 1	P0155	This DTC determines if the O2 sensor heater is functioning properly by monitoring the	Measured Heater Current.	Measured Heater current < 0.3 amps -OR-	No Active DTC's	ECT_Sensor_FA	8 failures out of 10 samples	2 trips Type B
					System Voltage	10.0 volts < system voltage< 32.0 volts		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
2 Sensor 1		current through the heater circuit.		Measured Heater current > 1.2 amps	Heater Warm-up delay O2S Heater device control B1S1 O2S Heater Duty Cycle All of the above met for Time	= Complete = Not active > zero > 120 seconds	Frequency: 2 tests per trip 10 seconds delay between tests and 1 second execution rate	
O2S Circuit Low Voltage Bank 2 Sensor 2	P0157	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 AIR intrusive test Fuel intrusive test Idle intrusive test EGR intrusive test System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Diag Equivalence Ratio Air Per Cylinder Fuel Control State Closed Loop Active All Fuel Injectors for active Cylinders Fuel Condition Fuel State	TPS_ThrottleAuthorityDefaulted MAP_SensorFA AIR System FA Ethanol Composition Sensor FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA = Not active = Not active = Not active = Not active 10.0 volts < system voltage< 32.0 volts = Not active = Not active = Not active = Not active = False 0.9805 ≤ equiv. ratio ≤ 1.0195 50 ≤ APC ≤ 500 mgrams = Closed Loop = TRUE Enabled (On) Ethanol <= 87% DFCO not active	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.
					All of the above met for Time	> 3.0 seconds		
O2S Circuit High Voltage Bank 2 Sensor 2	P0158	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** No Active DTC's System Voltage AFM Status Heater Warm-up delay Engine Run Time Engine Run Accum Fuel Condition	TPS_ThrottleAuthorityDefaulted MAF_SensorFA EthanolCompositionSensor_FA 10.0 volts < system voltage< 32.0 volts = All Cylinders active = Complete > 5 seconds > 150 seconds <= 87 % Ethanol	100 failures out of 125 samples Frequency: Continuous in 100 milli - second loop	2 trips Type B
					No Active DTC's Low Fuel Condition Diag Fuel Condition Initial delay after Open Test Criteria met (cold start condition) Initial delay after Open Test Criteria met (not cold start condition) Equivalence Ratio Air Per Cylinder Fuel Control State	MAP_SensorFA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA = False <= 87 % Ethanol > 105.0 seconds when engine soak time > 28800 seconds > 105.0 seconds when engine soak time ≤ 28800 seconds 0.9805 ≤ equiv. ratio ≤ 1.0195 50 ≤ APC ≤ 500 mgrams not = Power Enrichment		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					All of the above met for Time	> 3 seconds		
O2S Circuit Insufficient Activity Bank 2 Sensor 2	**P0160**	**This DTC determines if the O2 sensor circuit is open.**	**Measure Oxygen Sensor Signal.**	**1700 mvolts < Oxygen Sensor signal**	**No Active DTC's** **System Voltage** **AFM Status** **Heater Warm-up delay** **Engine Run Time** **Engine Run Accum** **Fuel**	**TPS_ThrottleAuthorityDefaulted** **MAF_SensorFA** **EthanolCompositionSensor_FA** **10.0 volts < system voltage< 32.0 volts** **= All Cylinders active** **= Complete** **> 5 seconds** **> 150 seconds** **<= 87 % Ethanol**	**100 failures out of 125 samples.** **Frequency: Continuous** **100msec loop**	**2 trips Type B**
O2S Heater Performance Bank 2 Sensor 2	**P0161**	**This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.**	**Measured Heater Current.**	**Measured Heater current < 0.3 amps** **-OR-** **Measured Heater current > 1.2 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** **10 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	>= **1.395**	Engine speed BARO Coolant Temp MAP Inlet Air Temp MAF Fuel Level	400 <rpm< 6600 > 70 kPa -38 <°C< 150 **5** <kPa< 255 -38 <°C< 150 **0.5** <g/s< **510**.0 > 10 % or if fuel sender is faulty	> 100 ms Frequency: Continuous Development data indicates that the Fuel Adjustment System Diagnostic (FASD) is typically	Type B 2 Trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Long Fuel Trim data accumulation:	> **47.0** seconds of data must accumulate on each trip, with at least **35.0** seconds of data in the current fuel trim cell before a pass or fail decision can be made.	(PASS) is typically enabled during **90** % 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.	
					Long-Term Fuel Trim Cell Usage			
					Closed Loop fueling enabled			
					Long Fuel Trim enabled	Closed Loop Enabled and coolant temp > 45 and < 120		
					EGR Flow Diag. Intrusive Test Not Active Catalyst Monitor Diag. Intrusive Test Not Active Post O2 Diag. Intrusive Test Not Active Device Control Not Active EVAP Diag. “tank pull down” Not Active fuel trim diagnosed during decels? No			
					No active DTCs:	IAC SystemRPM FA MAP SensorFA MAF SensorFA MAF SensorTFTKO AIR System FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak FA EvapEmissionSystem_FA FuelTankPressureSensorCircuit FA Ethanol Composition Sensor FA FuelInjectorCircuit_FA EngineMisfireDetected_FA EGRValvePerformance_FA EGRValveCircuit FA MAP_EngineVacuumStatus AmbientAirDefault_NA		
Fuel System Too Rich Bank 1	P0172	Determines if the fuel control system is in a rich condition, based on the filtered long-term			BARO Coolant Temp MAP	> 70 kPa -38 <°C< 150 **5** <kPa< 255	> 100 ms Frequency: Continuous	Type B 2 Trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		fuel trim metric. There are two different, yet related tests that are used to determine a Rich fault. They are Passive and Intrusive and are described below:			IAT MAF	**-38** <°C< 150 **0.5** <g/s< **510.0**	Development data indicates that the Fuel Adjustment System Diagnostic (FASD) is typically enabled during 90% 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.	
					Long Fuel Trim data accumulation:	> **47.0** seconds of data must accumulate on each trip, with at least **35.0** seconds of data in the current fuel trim cell before a pass or fail decision can be made.		
					Long-Term Fuel Trim Cell Usage Sometimes, certain Long-Term Fuel Trim Cells are not utilized for control or diagnosis. **Please see "Supporting Tables" Tab for a list of cells utilized for diagnosis.**			
					Closed Loop fueling enabled			
					Long Fuel Trim enabled	Closed Loop Enabled and coolant temp > 45 and < 120		
		Passive Test: Non-purge cells are monitored to determine if a rich condition exists.	The filtered Non-Purge Long Term Fuel Trim metric	<= **0.765**				
		Intrusive Test- When the filtered Purge Long Term Fuel Trim metric is <= **0.770**, purge is ramped off to determine if excess purge vapor is the cause of the Rich condition. If the filtered Purge Long Term Fuel Trim metric > **0.770**, the test passes without checking the filtered Non-Purge Long Term Fuel Trim metric.	If the filtered Purge Long Term Fuel Trim metric	<= **0.770**	A Passive Test decision cannot be made when Purge is enabled.	Fail determinations require that the Malfunction Criteria be satisfied for 3 out of 5 intrusive segments.		
			AND The filtered Non-Purge Long Term Fuel Trim metric	<= **0.765**				
			Segment Definition - Segments can last up to **45**, and are separated by the lesser of **12** seconds of purge-on time or enough time to purge **11** grams of vapor. A maximum of **5** completed segments or **20** intrusive attempts are allowed for each intrusive test. After an intrusive test report is completed, another intrusive test cannot occur for **225** 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 **200** seconds, indicating that the canister has been purged. Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions, and the execution frequency of other diagnostics				
					EGR Flow Diag. Intrusive Test Not Active Catalyst Monitor Diag. Intrusive Test Not Active Post O2 Diag. Intrusive Test Not Active Device Control Not Active			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					EVAP Diag. “tank pull down” Not Active fuel trim diagnosed during decels? No			
					No active DTCs:	IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR System FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSensorCircuit_FA Ethanol Composition Sensor FA FuelInjectorCircuit_FA EngineMisfireDetected_FA EGRValvePerformance_FA EGRValveCircuit_FA MAP_EngineVacuumStatus AmbientAirDefault_NA		
Fuel System Too Lean Bank 2	**P0174**	**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**	**>= 1.395**	**Engine speed** **BARO** **Coolant Temp** **MAP** **Inlet Air Temp** **MAF** **Fuel Level**	**400 <rpm< 6600** **> 70 kPa** **-38 <°C< 150** **5 <kPa< 255** **-38 <°C< 150** **0.5 <g/s< 510.0** **> 10 % or if fuel sender is faulty**	**> 100 ms** **Frequency: Continuous** **Development data indicates that the Fuel**	**Type B** **2 Trip(s)**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Long Fuel Trim data accumulation:	> 47 seconds of data must accumulate on each trip, with at least 35 seconds of data in the current fuel trim cell before a pass or fail decision can be made.	Adjustment System Diagnostic (FASD) is typically enabled during 90% 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.	
					Long-Term Fuel Trim Cell Usage			
					Closed Loop fueling enabled			
					Long Fuel Trim enabled	Closed Loop Enabled and coolant temp > 45 and < 120		
					EGR Flow Diag. Intrusive Test Not Active Catalyst Monitor Diag. Intrusive Test Not Active Post O2 Diag. Intrusive Test Not Active Device Control Not Active EVAP Diag. “tank pull down” Not Active fuel trim diagnosed during decels? No			
					No active DTCs:	IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR System FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSensorCircuit_FA Ethanol Composition Sensor FA FuelInjectorCircuit_FA EngineMisfireDetected_FA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						EGRValvePerformance_FA EGRValveCircuit_FA MAP_EngineVacuum Status AmbientAirDefault_NA		
Fuel System Too Rich Bank 2	P0175	Determines if the fuel control system is in a rich condition, based on the filtered long-term fuel trim metric. There are two different, yet related tests that are used to determine a Rich fault. They are Passive and Intrusive and are described below:			BARO Coolant Temp MAP IAT MAF Long Fuel Trim data accumulation:	> 70 kPa -38 <°C< 150 5 <kPa< 255 -38 <°C< 150 0.5 <g/s< 510.0 > 47 seconds of data must accumulate on each trip, with at least 35 seconds of data in the current fuel trim cell before a pass or fail decision can be made.	> 100 ms Frequency: Continuous Development data indicates that the Fuel Adjustment System Diagnostic (FASD) is typically enabled during 90 % of the EPAIII drive cycle. This is also typical of real-world driving, however values will vary (higher or lower) based on the actual conditions present during the drive cycle.	Type B 2 Trip(s)
					Long-Term Fuel Trim Cell Usage			
					Closed Loop fueling enabled			
					Long Fuel Trim enabled	Closed Loop Enabled and coolant temp > 45 and < 120		
		Passive Test: Non-purge cells are monitored to determine if a rich condition exists.	The filtered Non-Purge Long Term Fuel Trim metric	<= 0.765				
		Intrusive Test- When the filtered Purge Long Term Fuel Trim metric is <= 0.770, purge is ramped off to determine if excess purge vapor is the cause of the Rich condition.	If the filtered Purge Long Term Fuel Trim metric AND The filtered Non-Purge Long Term Fuel Trim metric	<= 0.770 <= 0.765	A Passive Test decision cannot be made when Purge is enabled.	Fail determinations require that the Malfunction Criteria be satisfied for 3 out of 5 intrusive segments.		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		If the filtered Purge Long Term Fuel Trim metric > 0.770, the test passes without checking the filtered Non-Purge Long Term Fuel Trim metric.	Segment Definition - Segments can last up to 45, and are separated by the lesser of 12 seconds of purge-on time or enough time to purge 11 grams of vapor. A maximum of 5 completed segments or 20 intrusive attempts are allowed for each intrusive test. After an intrusive test report is completed, another intrusive test cannot occur for 225 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 200 seconds, indicating that the canister has been purged. Performing intrusive tests too frequently may also affect EVAP and EPAIII emissions, and the execution frequency of other diagnostics.					
					EGR Flow Diag. Intrusive Test Not Active Catalyst Monitor Diag. Intrusive Test Not Active Post O2 Diag. Intrusive Test Not Active Device Control Not Active EVAP Diag. “tank pull down” Not Active fuel trim diagnosed during decels? No			
					No active DTCs:	IAC_SystemRPM_FA MAP_SensorFA MAF_SensorFA MAF_SensorTFTKO AIR System FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSensorCircuit_FA Ethanol Composition Sensor FA FuelInjectorCircuit_FA EngineMisfireDetected_FA EGRValvePerformance_FA EGRValveCircuit_FA MAP_EngineVacuumStatus AmbientAirDefault_NA		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
SIDI High Pressure Sensor Performance	P0191	This DTC detects a skewed fuel rail sensor via a comparison of measured pressure and commanded/modeled pressure				Enabled when a code clear is not active or not exiting device control Engine is not cranking		1 trips Type A
			Idle test (Low Side Fuel Pressure - High Side Fuel Pressure)	Disabled ≤ **-0.800** MPa OR ≥ **0.300** MPa	Vehicle Speed Pedal Position = 0 for Battery Voltage Low Pressure Fuel Pump Pressure Engine Run Time	<= 0.62 MPH 320 Counts (12.5ms per count) 11 <= Volts <= 32 ≥ 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Idle Test > = 240 counts (12.5ms per count)	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			High Drive Test (Relief Pressure - Measured high Pressure)	Disabled ≤ -2.00 MPa	Engine Speed Desired High Side Pressure Vehicle Speed Battery Voltage Low Pressure Fuel Pump Pressure Engine Run Time	1000 <= RPM <= 3000 4 <= MPa <= 6 >= 18.64 MPH 11 <= Volts <= 32 ≥ 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	High Drive Test >= 240 counts (12.5ms per count)	
			Low Drive Test (Commanded high Pressure - Measured high Pressure) AND Modeled Injection Pressure	Disabled ≥ 2.000 MPa ≥ 2.00 MPa	Engine Speed Desired High Side Pressure Vehicle Speed Battery Voltage Low Pressure Fuel Pump Pressure Engine Run Time	1000 <= RPM <= **3000** **4.00** <= MPa <= **6.00** >= **18.64** MPH 11 <= Volts <= 32 ≥ 0.275 MPa ≥ KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	LoDrive Test >= 240 counts (12.5ms per count)	

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

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 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
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 ≥ **0** 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 ≥ **0** 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 ≥ **0** 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 ≥ **0** 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 5 Open Circuit	**P0205**	**This DTC checks the circuit for electrical integrity during operation.**	**The ECM detects that the fuel injector 5 has determined to be an open circuit**		**Battery Voltage Engine Run Time**	**11 ≤ Volts ≤ 32 ≥ 0 Sec P062B not FA or TFTK**	**10 failures out of 20 samples 100 ms /sample Continuous**	**1 trips Type A**
Injector 6 Open Circuit	**P0206**	**This DTC checks the circuit for electrical integrity during operation.**	**The ECM detects that the fuel injector 6 has determined to be an open circuit**		**Battery Voltage Engine Run Time**	**11 ≤ Volts ≤ 32 ≥ 0 Sec P062B not FA or TFTK**	**10 failures out of 20 samples 100 ms /sample Continuous**	**1 trips Type A**
TPS2 Circuit Low	P0222	Detects a continuous or intermittent short or open in TPS2 circuit	TPS2 Voltage <	0.25		Run/Crank voltage or Powertrain relay voltage > **6.00** and reduced power is false, else the failure will be reported for all conditions No 5V reference error for #4 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
TPS2 Circuit High	P0223	Detects a continuous or intermittent short or open in TPS2 circuit	TPS2 Voltage >	4.59		Run/Crank voltage or Powertrain relay voltage > **6.00** and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 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 ≥ **0** 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 ≥ **0** Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Injector 2 Low side circuit shorted to 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 ≥ **0** 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 ≥ **0** Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 3 Low side circuit shorted to ground	P0267	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector low side is shorted to ground		Battery Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ **0** 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 ≥ 0 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 ≥ **0** 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 ≥ **0** Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 5 Low side circuit shorted to ground	**P0273**	**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 ≥ 0 Sec P062B not FA or TFTK**	**10 failures out of 20 samples 100 ms /sample Continuous**	**1 trips Type A**
Injector 5 Low side circuit shorted to power	**P0274**	**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 ≥ 0 Sec P062B not FA or TFTK**	**10 failures out of 20 samples 100 ms /sample Continuous**	**1 trips Type A**
Injector 6 Low side circuit shorted to ground	**P0276**	**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 ≥ 0 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 6 Low side circuit shorted to power	**P0277**	**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** **≥ 0 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 Cylinder 5 Misfire Detected Cylinder 6 Misfire Detected Cylinder 7 Misfire Detected Cylinder 8 Misfire Detected	P0300 P0301 P0302 P0303 P0304 P0305 P0306 P0307 P0308	These DTC's will determine if a random or a cylinder specific misfire is occurring by monitoring crankshaft velocity	Deceleration index vs. Engine Speed Vs Engine load Deceleration index calculation is tailored to specific veh. Tables used are 1st tables encountered that are not max of range. Undetectable region at a given speed/load point is where all tables are max of range point. see Algorithm Description Document for additional details. Misfire Percent Emission Failure Threshold Misfire Percent Catalyst Damage Engine Speed Engine Load Misfire counts (at low speed/loads, one cylinder may not cause cat damage)	**(>**Idle SCD AND > Idle SCD ddt Tables) **OR** (>SCD Delta AND > SCD Delta ddt Tables) **OR** (>Idle Cyl Mode AND > Idle Cyl Mode ddt Tables) **OR** (>Cyl Mode AND > Cyl Mode ddt Tables) **OR** (>Rev Mode Table) **OR** (> AFM Table in Cyl Deact mode) ≥ **0.79**% P0300 ≥ **0.79**% emission >"Catalyst Damaging Misfire Percentage" Table: **Unless** ≤ **0** rpm AND ≤ **0**% load AND ≥ 180 counts on one cylinder	Engine Run Time ECT If ECT at startup ECT System Voltage + Throttle delta - Throttle delta	> 2 crankshaft revolutions -7ºC < ECT < **122**ºC < -7ºC 21ºC < ECT < **122**ºC 9.00<volts<32.00 < **60.00**% per 25 ms < **60.00**% per 25 ms	Emission Exceedence = any (5) failed 200 rev blocks out of (16) 200 rev block tests Failure reported for (1) Exceedence in 1st (16) 200 rev block tests, or (4) Exceedences thereafter. any Catalyst Exceedence = (1) 200 rev block as data supports for catalyst damage. Failure reported with (1 or 3) Exceedences in FTP, or (1) Exceedence outside FTP. Continuous	2 Trips Type B (Mil Flashes with Catalyst Damaging Misfire)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Speed	450 < rpm < **6850 - 150** Engine speed limit is a function of inputs like Gear and temperature typical Engine Speed Limit = **7200** rpm	4 cycle delay	
				disable conditions:	No active DTCs:	TPS_FA EnginePowerLimited MAF_SensorTFTKO MAP_SensorTFTKO IAT_SensorTFTKO ECT_Sensor_Ckt_TFTKO 5VoltReferenceB_FA CrankSensorTestFailedTKO CrankSensorFaultActive CrankIntakeCamCorrelationFA CrankExhaustCamCorrelationFA CrankCamCorrelationTFTKO AnyCamPhaser_FA AnyCamPhaser_TFTKO TOSR_b_TOS_FA Clutch Position Fault TransEngagedState Emission Fault *** end optional content ***	4 cycle delay **Manual trans**
					P0315 & engine speed	> 1000 rpm		
					Fuel Level Low	LowFuelConditionDiagnostic	500 cycle delay	
					Cam and Crank Sensors	in sync with each other	4 cycle delay	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Misfire requests TCC unlock	Not honored because Transmission in hot mode or Post O2 intrusive diagnostic	4 cycle delay	
					Fuel System Status	≠ Fuel Cut	4 cycle delay	
					Active Fuel Management	Transition in progress	4 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	0 cycle delay	
					Manual Trans	Clutch shift	4 cycle delay	
					Throttle Position AND Automatic transmission shift	> **97.60**%	7 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:	 **3** engine cycles after misfire **2** Engine cycles after		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Abnormal engine speed oscillations: (Rough road etc) Off Idle, number of consecutive decelerating cylinders after accelerating,: (Number of decels can vary with misfire detection equation) TPS Engine Speed Veh Speed SCD Cyl Mode Rev Mode	 > 3 % > **900** rpm > 5 kph 0 (1=Yes) WheelSpeedInECM		
Crankshaft Position System Variation Not Learned	P0315	Monitor for valid crankshaft error compensation factors	Sum of Compensation factors	≥ **3.0040** OR ≤ **2.9960**	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 ≥ 0 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	> **8.0000**	Engine Speed	≥ 400 RPM	Weight Coefficient = **0.0300**	
			Filtered FFT Intensity: (for Abnormal Noise) VaKNKD_k_PerfCylAbnFiltIntnsity	< Abnormal Noise Threshold (see supporting tables)	Engine Speed	≥ **2200** RPM	Weight Coefficient = **0.0300**	
							Updated each engine event Max time to set = 10 seconds	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Knock Sensor (KS) Circuit Bank 1	P0325	This diagnostic checks for an open in the knock sensor circuit	Filtered FFT Output (VaKNKD_k_OpenFiltIntensity[0])	> OpenCktThrshMin **and** < OpenCktThrshMax	Diagnostic Enabled (1 = Enabled)	= 1	First Order Lag Filter with Weight Coefficient	Type: B MIL: YES Trips: 2
					Engine Speed	≥ 400 RPM and ≤ 8500 RPM		
					Engine Air Flow	≥ **50** 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	≥ **0** 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	> 8.0000	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	≥ **2200** RPM	Weight Coefficient = **0.0100**	
							Updated each engine event Max time to set = 10 seconds	
Knock Sensor (KS) Circuit Low Bank 1	P0327	This diagnostic checks for an out of range low knock sensor signal	Sensor Input Signal Line	< 0.57 Volts	Diagnostic Enabled (1 = Enabled)	= 1	50 Failures out of 63 Samples	Type: B MIL: YES Trips: 2
					Engine Speed	> 400 RPM and < 8500 RPM		
			or					
			Sensor Return Signal Line	< 0.40 Volts			100 msec rate	
Knock Sensor (KS) Circuit High Bank 1	P0328	This diagnostic checks for an out of range high knock sensor signal	Sensor Input Signal Line	> 2.76 Volts	Diagnostic Enabled (1 = Enabled)	= 1	50 Failures out of 63 Samples	Type: B MIL: YES Trips: 2
					Engine Speed	> 400 RPM and < 8500 RPM		
			or					
			Sensor Return Signal Line	> 1.95 Volts				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							100 msec rate	
Knock Sensor (KS) Circuit Bank 2	**P0330**	**This diagnostic checks for an open in the knock sensor circuit**	**Filtered FFT Output (VaKNKD_k_OpenFiltIntensity[1])**	**> OpenCktThrshMin and < OpenCktThrshMax**	**Diagnostic Enabled (1 = Enabled)**	**= 1**	**First Order Lag Filter with Weight Coefficient**	**Type: B MIL: YES Trips: 2**
					Engine Speed	**≥ 400 RPM and ≤ 8500 RPM**		
					Engine Air Flow	**≥ 50 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 2	**P0331**	**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	**≥ 0 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	**> 8.0000**	**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**	**≥ 2200 RPM**	**Weight Coefficient = 0.0100**	
							Updated each engine event	
							Max time to set = 10 seconds	
Knock Sensor (KS) Circuit Low Bank 2	**P0332**	**This diagnostic checks for an out of range low knock sensor signal**	**Sensor Input Signal Line**	**< 0.57 Volts**	**Diagnostic Enabled (1 = Enabled)**	**= 1**	**50 Failures out of 63 Samples**	**Type: B MIL: YES Trips: 2**
					Engine Speed	**> 400 RPM and < 8500 RPM**		
			or					
			Sensor Return Signal Line	**< 0.40 Volts**			**100 msec rate**	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Knock Sensor (KS) Circuit High Bank 2	**P0333**	**This diagnostic checks for an out of range high knock sensor signal**	**Sensor Input Signal Line** **or** **Sensor Return Signal Line**	**> 2.76 Volts** **> 1.95 Volts**	**Diagnostic Enabled (1 = Enabled)** **Engine Speed**	**= 1** **> 400 RPM and < 8500 RPM**	**50 Failures out of 63 Samples** **100 msec rate**	**Type: B** **MIL: YES** **Trips: 2**
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 Time-Based Crankshaft Test: No crankshaft pulses received Event-Based Crankshaft Test: No crankshaft pulses received	 >= 4.0 seconds >= **0.1** 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 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:	 = FALSE = FALSE = FALSE > 3.0 grams/second)) 5VoltReferenceB FA 5VoltReferenceA FA 5VoltReferenceB FA P0365 P0366	Engine-Cranking Crankshaft Test: Continuous every 100 msec Time-Based Crankshaft Test: Continuous every 12.5 msec Event-Based Crankshaft Test: 2 failures out of 10 samples One sample per engine revolution	Type B 2 trips
Crankshaft Position (CKP) Sensor A Performance	P0336	Determines if a performance fault exists with the crank position sensor signal	Crank Re-synchronization Test: Time in which 20 or more crank re-synchronizations occur Time-Based Crankshaft Test:	 < 25.0 seconds	Crank Re-synchronization Test: Engine Air Flow Cam-based engine speed No DTC Active: Time-Based Crankshaft Test:	 >= 3.0 grams/second > 450 RPM 5VoltReferenceB FA P0335	Crank Re-synchronization Test: Continuous every 250 msec Time-Based Crankshaft Test:	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			No crankshaft synchronization gap found	>= 0.4 seconds	Engine is Running Starter is not engaged No DTC Active:	 5VoltReferenceB FA	Continuous every 12.5 msec	
			Engine Start Test during Crank: Time since starter engaged without detecting crankshaft synchronization gap	>= 1.5 seconds	Engine Start Test during Crank: 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 Start Test during Crank: Continuous every 100 msec	
			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	 >= 5.5 seconds >= 4.0 seconds	Engine Cranking Camshaft Test: Starter engaged AND (cam pulses being received OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	 = FALSE = FALSE = FALSE > 3.0 grams/second))	Engine Cranking Camshaft Test: Continuous every 100 msec	Type B 2 trips
			Time-Based Camshaft Test: Fewer than 4 camshaft pulses received in a time	 > 3.0 seconds	Time-Based Camshaft Test: Engine is Running Starter is not engaged No DTC Active:	 5VoltReferenceA FA	Time-Based Camshaft Test: Continuous every 100 msec	
			Fast Event-Based Camshaft Test:		Fast Event-Based Camshaft Test:		Fast Event-Based	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			No camshaft pulses received during first 12 MEDRES events (There are 12 MEDRES events per engine cycle) <u>Slow Event-Based Camshaft Test:</u> The number of camshaft pulses received during 100 engine cycles	= 0	Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active: <u>Slow Event-Based Camshaft Test:</u> Crankshaft is synchronized No DTC Active:	5VoltReferenceA FA 5VoltReferenceB FA CrankSensor FA 5VoltReferenceA FA 5VoltReferenceB FA CrankSensor FA	<u>Camshaft Test:</u> Continuous every MEDRES event <u>Slow Event-Based Camshaft Test:</u> 8 failures out of 10 samples Continuous every engine cycle	
Camshaft Position (CMP) Sensor Performance Bank 1 Sensor A	P0341	Determines if a performance fault exists with the cam position bank 1 sensor A signal	<u>Fast Event-Based Camshaft Test:</u> The number of camshaft pulses received during first 12 MEDRES events is less than 4 or greater than **6** (There are 12 MEDRES events per engine cycle) <u>Slow Event-Based Camshaft Test:</u> The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	<u>Fast Event-Based Camshaft Test:</u> Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active: <u>Slow Event-Based Camshaft Test:</u> Crankshaft is synchronized No DTC Active:	5VoltReferenceA FA 5VoltReferenceB FA CrankSensor FA 5VoltReferenceA FA 5VoltReferenceB FA CrankSensor FA	<u>Fast Event-Based Camshaft Test:</u> Continuous every MEDRES event <u>Slow Event-Based Camshaft Test:</u> 8 failures out of 10 samples Continuous every engine cycle	Type B 2 trips
Camshaft Position (CMP) Sensor Circuit Bank 2 Sensor A	**P0345**	**Determines if a fault exists with the cam position bank 2 sensor A signal**	**<u>Engine Cranking Camshaft Test:</u> Time since last camshaft position sensor pulse received OR**	**>= 5.5 seconds**	**<u>Engine Cranking Camshaft Test:</u> Starter engaged AND (cam pulses being received**		**<u>Engine Cranking Camshaft Test:</u> Continuous every 100 msec**	**Type B 2 trips**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Time that starter has been engaged without a camshaft sensor pulse	>= 4.0 seconds	OR (DTC P0101 AND DTC P0102 AND DTC P0103 AND Engine Air Flow	= FALSE = FALSE = FALSE > 3.0 grams/second))		
			Time-Based Camshaft Test: Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Time-Based Camshaft Test: Engine is Running Starter is not engaged No DTC Active:	5VoltReferenceA_FA	Time-Based Camshaft Test: Continuous every 100 msec	
			Fast Event-Based Camshaft Test: No camshaft pulses received during first 12 MEDRES events (There are 12 MEDRES events per engine cycle)		Fast Event-Based Camshaft Test: Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor FA	Fast Event-Based Camshaft Test: Continuous every MEDRES event	
			Slow Event-Based Camshaft Test: The number of camshaft pulses received during 100 engine cycles	= 0	Slow Event-Based Camshaft Test: Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor FA	Slow Event-Based Camshaft Test: 8 failures out of 10 samples Continuous every engine cycle	
Camshaft Position (CMP) Sensor Performance Bank 2 Sensor A	P0346	Determines if a performance fault exists with the cam position bank 2 sensor A signal	Fast Event-Based Camshaft Test: The number of camshaft pulses received during first 12 MEDRES events is less than 4 or greater than 6 (There are 12 MEDRES events		Fast Event-Based Camshaft Test: Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged		Fast Event-Based Camshaft Test: Continuous every MEDRES event	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			per engine cycle) **Slow Event-Based Camshaft Test:** **The number of camshaft pulses received during 100 engine cycles** **OR**	**< 398** **> 402**	**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**	**Slow Event-Based Camshaft Test:** **8 failures out of 10 samples** **Continuous every engine cycle**	
IGNITION CONTROL #1 CIRCUIT	P0351	This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 1 (Cylinders 1 and 4 for V6 with waste spark)	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine running Ignition Voltage	**> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2
IGNITION CONTROL #2 CIRCUIT	P0352	This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 2 (Cylinders 2 and 5 for V6 with waste spark)	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine running Ignition Voltage	**> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2
IGNITION CONTROL #3 CIRCUIT	P0353	This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 3 (Cylinders 3 and 6 for V6 with waste spark)	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine running Ignition Voltage	**> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2
IGNITION CONTROL #4 CIRCUIT	P0354	This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 4 (if applicable)	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine running Ignition Voltage	**> 6.00 Volts**	50 Failures out of 63 Samples 100 msec rate	Type: B MIL: YES Trips: 2

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
IGNITION CONTROL #5 CIRCUIT	**P0355**	**This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 5 (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**
IGNITION CONTROL #6 CIRCUIT	**P0356**	**This diagnostic checks the circuit for electrical integrity during operation. Monitors EST for Cylinder 6 (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	 = 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 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.
					No DTC Active:	5VoltReferenceA FA 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 **6** (There are 12 MEDRES events per engine cycle)		Fast Event-Based Camshaft Test: Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	5VoltReferenceA FA 5VoltReferenceB FA CrankSensor FA	Fast Event-Based Camshaft Test: Continuous every MEDRES event	Type B 2 trips
			Slow Event-Based Camshaft Test: The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	Slow Event-Based Camshaft Test: Crankshaft is synchronized No DTC Active:	5VoltReferenceA FA 5VoltReferenceB FA CrankSensor FA	Slow Event-Based Camshaft Test: 8 failures out of 10 samples Continuous every engine cycle	
Camshaft Position (CMP) Sensor Circuit Bank 2 Sensor B	**P0390**	**Determines if a fault exists with the cam position bank 2 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**	**>= 5.5 seconds** **>= 4.0 seconds**	**Engine Cranking Camshaft Test:** **Starter engaged** **AND** **(cam pulses being received** **OR** **(DTC P0101** **AND DTC P0102** **AND DTC P0103** **AND** **Engine Air Flow**	**= FALSE** **= FALSE** **= FALSE** **> 3.0 grams/second))**	**Engine Cranking Camshaft 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 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) Slow Event-Based Camshaft Test: The number of camshaft pulses received during 100 engine cycles	> 3.0 seconds = 0	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: Slow Event-Based Camshaft Test: Crankshaft is synchronized No DTC Active:	5VoltReferenceA_FA 5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor FA 5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor FA	Time-Based Camshaft Test: Continuous every 100 msec Fast Event-Based Camshaft Test: Continuous every MEDRES event Slow Event-Based Camshaft Test: 8 failures out of 10 samples Continuous every engine cycle	
Camshaft Position (CMP) Sensor Performance Bank 2 Sensor B	P0391	Determines if a performance fault exists with the cam position bank 2 sensor B signal	Fast Event-Based Camshaft Test: The number of camshaft pulses received during first 12 MEDRES events is less than 4 or greater than 6 (There are 12 MEDRES events per engine cycle)		Fast Event-Based Camshaft Test: Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	5VoltReferenceA_FA 5VoltReferenceB_FA CrankSensor FA	Fast Event-Based Camshaft Test: Continuous every MEDRES event	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Slow Event-Based Camshaft Test: **The number of camshaft pulses received during 100 engine cycles** **OR**	**< 398** **> 402**	**Slow Event-Based Camshaft Test:** **Crankshaft is synchronized** **No DTC Active:**	**5VoltReferenceA_FA** **5VoltReferenceB_FA** **CrankSensor FA**	**Slow Event-Based Camshaft Test:** **8 failures out of 10 samples** **Continuous every engine cycle**	
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 **6** tests per trip Frequency: Fueling Related : 12.5 ms OSC Measurements: 100 ms Temp Prediction:	Type A 1 Trip(s)
		The catalyst washcoat contains Cerium Oxide. Cerium Oxide reacts with NO and O2 during lean A/F excursions to store the excess oxygen (I.e. Cerium Oxidation). During rich A/F excursions, Cerium Oxide reacts with CO and H2 to release this stored oxygen (I.e. Cerium Reduction). This is referred to as the Oxygen Storage Capacity, or OSC. CatMon's strategy is to "measure" the OSC of the catalyst through forced Lean and Rich A/F excursions Normalized Ratio OSC Value Calculation Information and Definitions = 1. Raw OSC Calculation = (post cat O2 Resp time - pre cat O2 Resp time) 2. BestFailing OSC value from a calibration table (based on temp and exhaust gas flow)			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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		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.						
		The Catalyst Monitoring Test is done during idle. Several conditions must be meet in order to execute this test. These conditions and their related values are listed in the secondary parameters area of this document.			Vehicle Speed	*< 1.24 MPH*		
					Engine speed	> **965** RPM for a minimum of **15** 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Ethanol Estimation	NOT in Progress		
					ECT	***40*** *< ° C <* ***127***		
					Barometric Pressure	> 70 KPA		
					Idle Time before going intrusive is	< **20** 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	***0.80*** *< ST FT <* ***1.20***		
					Predicted catalyst temp > **450** 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 **15** seconds with a closed throttle time **< 60** 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 **15** 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 A Function of Time also based on Start-up coolant temp. **Please see "Supporting Tables" Tab**			
					PRNDL			
					Idle Stable Criteria :: Must hold true from after Catalyst Idle Conditions Met to the end of test			
					MAF	*2.50 < g/s < 12.50*		
					Predicted catalyst temperature	< **850** degC		
					Engine Fueling Criteria at Beginning of Idle Period			
					The following fueling related must also be met from between 4 and 7 seconds after the Catalyst Idle Conditions Met Criteria has been met for at least 4 seconds prior to allowing intrusive control			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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.**530** and the current OSC Normalized Ratio value is < **0.290**			
					Maximum of **18** RSR tests to detect failure when RSR is enabled.			
					Green Converter Delay Criteria			
					This is part of the check for the Catalyst Idle Conditions Met Criteria section			
					The diagnostic will not be enabled until the following has been met:			
					Predicted catalyst temperature > 550 ° C for 3600 seconds non-continuously. Note: this feature is only enabled when the vehicle is new and cannot be enabled in service			
					General Enable			
					DTC's Not Set			
					MAF_SensorFA			
					MAF_SensorTFTKO			
					AmbientAirDefault_NA			
					IAT_SensorCircuitFA			
					IAT_SensorCircuitTFTKO			
					ECT_Sensor_FA			
					O2S_Bank_1_Sensor_1_FA			
					O2S_Bank_1_Sensor_2_FA			
					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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					CrankSensor_FA			
					TPS_Performance_FA			
					EnginePowerLimited			
					VehicleSpeedSensor_FA			
					AmbientAirDefault_NoSnsr			
Catalyst System Low Efficiency Bank 2	**P0430**	**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 6 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			**Driver must be off the accel pedal. This checks that the final accel pedal position (comprehending deadband and hysteresis) is essentially zero.**			
		The Catalyst Monitoring Test is done during idle. Several conditions must be meet in order to execute this test. These conditions and their related values are listed in the secondary parameters area of this document.			**Vehicle Speed**	***< 1.24 MPH***		
					Engine speed	**> 965 RPM for a minimum of 15 seconds since end of last idle period.**		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine run time	≥ MinimumEngineRunTime, This is a function of Coolant Temperture, please see Supporting Tables		
					Tests attempted this trip	< 255		
					The catalyst diagnostic has not yet completed for the current trip.			
					Catalyst Idle Conditions Met Criteria			
					General Enable met and the Valid Idle Period Criteria met			
					Green Converter Delay	Not Active		
					Induction Air	*-20 < ° C < 250*		
					Intrusive test(s): Fueltrim Post O2 EVAP EGR	Not Active		
					Other vehicle functions: Power Take Off	Not Active		
					RunCrank Voltage	> 10.90 Volts		
					Ethanol Estimation	NOT in Progress		
					ECT	*40 < ° C < 127*		
					Barometric Pressure	> 70 KPA		
					Idle Time before going intrusive is	< 20 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	*0.80 < ST FT < 1.20*		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Predicted catalyst temp > 450 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 15 seconds with a closed throttle time < 60 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 15 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			
					PRNDL			
					Idle Stable Criteria :: Must hold true from after Catalyst Idle Conditions Met to the end of test			
					MAF	*2.50 < g/s < 12.50*		
					Predicted catalyst temperature	< 850 degC		
					Engine Fueling Criteria at Beginning of Idle Period			
					The following fueling related must also be met from between 4 and 7 seconds after the Catalyst Idle Conditions Met Criteria has been met for at least 4 seconds prior to allowing intrusive control			
					Number of pre-O2 switches	>= 2		
					Short Term Fuel Trim Avg	*0.96 < ST FT Avg < 1.04*		
					Rapid Step Response (RSR) feature will initiate multiple tests:			
					If the difference between current EWMA value and the current OSC Normalized Ratio value is > 0.570 and the current OSC Normalized Ratio value is < 0.270			
					Maximum of 18 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			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					The diagnostic will not be enabled until the following has been met:			
					Predicted catalyst temperature > 550 ° C for 3600 seconds non-continuously. **Note: this feature is only enabled when the vehicle is new and cannot be enabled in service**			
					General Enable			
					DTC's Not Set			
					MAF_SensorFA			
					MAF_SensorTFTKO			
					AmbientAirDefault_NA			
					IAT_SensorCircuitFA			
					IAT_SensorCircuitTFTKO			
					ECT_Sensor_FA			
					O2S_Bank_1_Sensor_1_FA			
					O2S_Bank_1_Sensor_2_FA			
					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	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		Fuel Level Drive Time Drive length ECT Baro	10 % ≤ Percent ≤ 90 % ≥ 600 seconds ≥ **6.2** miles ≥ 70 °C ≥ 70 kPa	Once per trip, during hot soak (up to 2400 sec.). No more than 2 unsuccessful	1 trip Type A EWMA Average run length is 6

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		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.	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).		Odometer	≥ 10.0 miles	unsuccessful attempts between completed tests.	length is 6 under normal conditions Run length is 3 to 6 trips after code clear or non-volatile reset
					Engine not run time before key off must be	≤ refer to "P0442: Engine Off Time Before Vehicle Off Maximum as a Function of Estimated Ambient Temperature table" in Supporting Tables.		
					Time since last complete test if normalized result and EWMA is passing	≥ 17 hours		
					OR Time since last complete test if normalized result or EWMA is failing	≥ 10 hours		
					Estimated ambient temperature at end of drive	0 °C ≤ Temperature ≤ 34 °C		
					Estimate of Ambient Air Temperature Valid			
			When EWMA is	> 0.65 (EWMA Fail Threshold)				
		After the volatility check, the vent solenoid will close. After the vent is closed, typically a build up of pressure from the hot soak begins (phase-1). The pressure typically will peak and then begin to decrease as the fuel cools. When the pressure drops (-62.27) Pa from peak pressure, the vent is then opened for 60 seconds to normalize the system pressure. The vent is again closed to begin the vacuum portion of the test (phase-2). As the fuel temperature continues to fall, a vacuum will begin forming. The vacuum will continue until it reaches a vacuum peak. When the pressure rises 62.27 Pa from	. 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	≤ 0.35 (EWMA Re-Pass Threshold)					
					Conditions for Estimate of Ambient Air Temperature to be valid:			
					1. Cold Start Startup delta deg C (ECT-IAT)	≤ 8 °C		
					OR **2. Short Soak and Previous EAT Valid** Previous time since engine off	≤ 7200 seconds		
					OR **3. Less than a short soak and Previous EAT Not Valid** Previous time since engine off	≤ 7200 seconds		
					AND			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		vacuum peak, the test then completes. If the key is turned on while the diagnostic test is in progress, the test will abort.			Must expire Estimate of Ambient Temperature Valid Conditioning Time. **"P0442: Estimate of Ambient Temperature Valid Conditioning Time" in Supporting Tables Tab.**	Vehicle Speed ≥ **24.9** mph AND Mass Air Flow ≥ **8** g/sec		
					OR **4. Not a Cold Start and greater than a Short Soak**			
					Previous time since engine off AND	> 7200 seconds		
					Must expire maximum value in Estimate of Ambient Temperature Valid Conditioning Time. **Please see "P0442: Estimate of Ambient Temperature Valid Conditioning Time" in Supporting Tables Tab.**	Vehicle Speed ≥ **24.9** mph AND Mass Air Flow ≥ **8** g/sec		
					Conditions for Estimate of Ambient Air Temperature to be valid:			
					1. Cold Start Startup delta deg C (ECT-IAT) OR	≤ 8 °C		
					2. Short Soak and Previous EAT Valid Previous time since engine off OR	≤ 7200 seconds		
					3. Time since EAT Valid Time since EAT valid OR	≤ 7200 seconds		
					4. Not a Cold Start and greater than a Short Soak Previous time since engine off AND	> 7200 seconds		
					Must expire maximum value in Estimate of Ambient Temperature Valid Conditioning Time. **Please see "P0442: Estimate of Ambient Temperature Valid Conditioning Time" in Supporting Tables Tab.**	Vehicle Speed ≥ 24.9 mph AND Mass Air Flow ≥ 8 g/sec		
				Abort Conditions:	**1. High Fuel Volatility** During the volatility phase, pressure in the fuel tank is integrated vs. time. If the integrated pressure is then test aborts and unsuccessful attempts is incremented.	**> -5**		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					attempts to intermittent 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 OR **5. Vacuum Out of Range and Refueling Detected** See P0451 Fault Code for information on vacuum sensor out of range and P0464 Fault Code for information on fuel level refueling. OR **6. Vent Valve Override Failed** Device control using an off-board tool to control the vent solenoid, cannot exceed during the EONV test OR **7. Key up during EONV test**	0.50 seconds		
					No active DTCs:	FuelLevelDataFault MAF SensorFA ECT Sensor FA IAT SensorFA VehicleSpeedSensor_FA IgnitionOffTimeValid AmbientAirDefault P0443 P0446 P0449 P0452 P0453 P0455 P0496		
Evaporative Emission (EVAP)	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		Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples 250 ms /sample	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Canister Purge Solenoid Valve Circuit (ODM)		operation.	and the actual state of the control circuit do not match.				Continuous with solenoid operation	
Evaporative Emission (EVAP) Vent System Performance	P0446	This DTC will determine if a restriction is present in the vent solenoid, vent filler, vent hose or EVAP canister. This test runs with normal purge and vent valve is open.	Vent Restriction Prep Test: Vented Vacuum or Vented Vacuum for 60 seconds Vent Restriction Test: Tank Vacuum for 5 seconds BEFORE Purge Volume 2 liters of fuel must be consumed after setting the DTC active the first time to set the DTC active the second time.	< -623 Pa > 1245 Pa > 2989 Pa ≥ **6** liters	Fuel Level System Voltage Startup IAT Startup ECT BARO No active DTCs:	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C ≥ 70 kPa MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT SensorCircuitFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454	Once per Cold Start Time is dependent on driving conditions Maximum time before test abort is 1000 seconds	2 trips Type B
Evaporative Emission (EVAP) Vent Solenoid Control Circuit (ODM)	P0449	This DTC checks the circuit for electrical integrity during operation. If the P0449 is active, an intrusive test is performed with the vent solenoid commanded closed for 15 seconds.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples 250 ms / sample Continuous with solenoid operation	2 trips Type B
Fuel Tank Pressure (FTP) Sensor Circuit Performance	P0451	The DTC will be set if the fuel tank vacuum sensor is out of range when it tries to re-zero prior to the phase-1 or phase-2 portions of the engine-off natural vacuum small leak test.	The tank vacuum sensor voltage is compared to a window about the nominal sensor voltage offset (~1.5 volts) Upper voltage threshold (voltage addition above the nominal voltage) Lower voltage threshold (voltage subtraction below the nominal	0.2 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 Run length is 2

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			voltage) The difference between tank vacuum sensor voltage and the nominal offset voltage is then normalized against the appropriate threshold listed above to produce a ratio between 0.0 and 1.0. This normalized re-zero ratio is then filtered with a EWMA (with 0= perfect pass and 1=perfect fail). When EWMA is , the DTC light is illuminated. The DTC light can be turned off if the EWMA is and stays below the EWMA fail threshold for 2 additional consecutive trips.	0.2 volts > 0.73 (EWMA Fail Threshold) ≤ 0.40 (EWMA Re-Pass Threshold)			The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete.	trips after code clear or non-volatile reset
Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage	P0452	This DTC will detect a fuel tank pressure sensor signal that is too low out of range.	Fuel tank pressure sensor signal The normal operating range of the fuel tank pressure sensor is 0.5 volts (~1245 Pa) to 4.5 volts (~ -3736 Pa).	< 0.15 volts (3 % of Vref or ~ 1681 Pa)	Time delay after sensor power up for sensor warm-up ECM State ≠ crank	is 0.10 seconds	80 failures out of 100 samples 100 ms / sample Continuous	2 trips Type B
Fuel Tank Pressure (FTP) Sensor Circuit High Voltage	P0453	This DTC will detect a fuel tank pressure sensor signal that is too high out of range.	Fuel tank pressure sensor signal The normal operating range of the fuel tank pressure sensor is 0.5 volts (~1245 Pa) to 4.5 volts (~ -3736 Pa).	> 4.85 volts (97% of Vref or ~ -4172 Pa)	Time delay after sensor power up for sensor warm-up ECM State ≠ crank	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	If an abrupt change in tank vacuum is detected the engine-off natural vacuum test is aborted due to an apparent refueling		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	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		abort due to an apparent re-fueling event.	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. The abrupt change is defined as a change in vacuum: in the span of 1.0 seconds. A refueling event is confirmed if the fuel level has a persistent change for 30 seconds.	112 Pa < Vacuum < 249 Pa of **15** %			test. The test can only execute up to once per engine-off period. The length of the test is determined by the refueling rationality test, which can take up to 600 seconds to complete. The test will report a failure if 2 out of 3 samples are failures.	
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.	> **15** liters ≤ 2740 Pa ≥ 2740 Pa	Fuel Level System Voltage BARO Purge Flow No active DTCs: Cold Start Test If ECT > IAT, Startup temperature delta (ECT-IAT): Cold Test Timer Startup IAT Temperature Startup ECT Weak Vacuum Follow-up Test	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts ≥ 70 kPa ≥ **1.50** % MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorCircuitFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454 ≤ 8 °C ≤ 1000 seconds 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C	Once per cold start Time is dependent on driving conditions Maximum time before test abort is 1000 seconds <u>Weak Vacuum Follow-up Test</u> With large leak detected, the follow-up test is limited to 1300 seconds. Once the MIL is on, the follow-up test runs	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					This test can run following a weak vacuum failure or on a hot restart.		indefinitely.	
Fuel Level Sensor 1 Performance	P0461	This DTC will detect a fuel sender stuck in range in the primary fuel tank.			Engine Running No active DTCs:	VehicleSpeedSensor_FA	250 ms / sample Continuous	2 trips Type B
			Fuel Level in Primary Tank Remains in an Unreadable Range too Long					
			If fuel volume in primary tank is **AND** **Fuel volume in secondary tank** **and remains in this condition for** OR	**>= 30.0 liters** **< 4.5 liters** **149 miles**				
			After Refuel Event					
			If the secondary fuel volume changes by 16.0 liters from engine "off" to engine "on" the primary volume should change by 3.0 liters. OR		**The shutdown primary tank volume + 3.0 liters must be**	**< 30.0 liters**		
			Distance Traveled without a Primary Fuel Level Change					
			Delta Fuel Volume change over an accumulated **103** miles.	< 3 liters				
Fuel Level Sensor 1 Circuit Low Voltage	P0462	This DTC will detect a fuel sender stuck out of range low in the primary fuel tank.	Fuel level Sender % of 5V range	< 10 %	Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	180 failures out of 225 samples 100 ms / sample Continuous	2 trips Type B
Fuel Level Sensor 1 Circuit High Voltage	P0463	This DTC will detect a fuel sender stuck out ofrange high in the primary fuel tank.	Fuel level Sender % of 5V range	> 60 %	Run/Crank Voltage	11 volts ≤ Voltage ≤ 32 volts	180 failures out of 225 samples 100 ms / sample Continuous	2 trips Type B
Fuel Level Sensor 1 Circuit Intermittent	P0464	This DTC will detect intermittent fuel level sensor signals that would have caused the engine-off natural vacuum small leak test to abort due to an apparent re-fueling event.	If a change in fuel level is detected, the engine-off natural vacuum test is aborted due to an apparent refueling event. Subsequent to the abort, a refueling rationality test is executed to confirm that an actual refueling event occurred. If a refueling event is confirmed, then the test sample is considered passing. Otherwise, the sample is considered failing indicating an intermittent signal problem.		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 trip Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			An intermintant change in fuel level is defined as: The fuel level changes and does not remain for 30 seconds during a 600 second refueling rationality test.	by **15** % > **15** %			The test will report a failure if **1** out of 3 samples are failures	
Cooling Fan 1 Relay Control Circuit (ODM)	P0480	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 400 RPM	~~20~~ **50** failures out of ~~25~~ **63** samples ~~**250**~~ **100** ms / sample Continuous with fan operation	2 trips Type B Not used on systems with Mechanical Fan)
Cooling Fan 2 Relay Control Circuit (ODM)	P0481	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 400 RPM	~~20~~ **50** failures out of ~~25~~ **63** samples ~~**250**~~ **100** ms / sample Continuous with fan operation	2 trips Type B Not used on systems with Mechanical Fan)
Evaporative Emission (EVAP) System Flow During Non-Purge	P0496	This DTC will determine if the purge solenoid is leaking to engine manifold vacuum. This test will run with the purge valve closed and the vent valve closed.	Tank Vacuum for 5 seconds BEFORE Test time	> 2491 Pa ≥ refer to "P0496: Purge Valve Leak Test Engine Vacuum Test Time (Cold Start) as a Function of Fuel Level table" in Supporting Tables Tab.	Fuel Level System Voltage BARO Startup IAT Temperature Startup ECT Engine Off Time No active DTCs:	10% ≤ Percent ≤ 90% 11 volts ≤ Voltage ≤ 32 volts ≥ 70 kPa 4 °C ≤ Temperature ≤ 30 °C ≤ 35 °C ≥ 28800.0 seconds MAP_SensorFA TPS_FA VehicleSpeedSensor_FA IAT_SensorCircuitFA ECT_Sensor_FA AmbientAirDefault EnginePowerLimited P0443 P0449 P0452 P0453 P0454	Once per cold start Cold start: max time is 1000 seconds	2 trips Type B
Transmission Output Speed Sensor (TOSS)	**P0502**	**No activity in the TOSS circuit**	**TOSS Raw Speed**	**≤ 60 RPM**			**≥ 4.5 sec**	**Type B 2 trips**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Torque	**54.0 ≤ N-M ≤ 8191.8**		
					Minimum Throttle opening	**≥ 8.0 %**		
					Engine Speed	**1500 ≤ RPM ≤ 6500**		
					Ignition voltage	**11.0 ≤ Volts ≤ 32.0**		
					PTO	**not active**		
					EngineTorqueEstInaccurate	**FALSE**		
					P0503	**Not failed this key cycle**		
Transmission Output Speed Sensor (TOSS)	**P0503**	**TOSS Signal Intermittent**	**Loop-to-Loop change in TOSS**	**≥ 350 RPM**	**Raw Output Speed**	**≥ 300 RPM for ≥ 2.0 sec**	**≥ 3.3 sec**	**Type B 2 trips**
					Output Speed change	**≤ 150 RPM for ≥ 2.0 sec**		
					Time since transfer case range change	**≥ 6.0 sec**		
					Ignition voltage	**11.0 ≤ Volts ≤ 32.0**		
					Engine Speed	**200 ≤ RPM ≤ 7500 for > 5.0 seconds**		
					Vehicle Speed	**≤ 124 MPH for ≥ 5.0 sec**		
					PTO	**not active**		
Low Engine Speed Idle system	P0506	This DTC will determine if a low idle exists	Filtered Engine Speed Error	> 94.00 rpm	Baro	> 70 kPa	Diagnostic runs in every 12.5 ms loop	2 trips Type B
			filter coefficient	0.0035	Coolant Temp	> 60 °C		
					Engine run time	≥ 60 sec	Diagnostic reports pass or fail in	
					Ignition voltage	32 ≥ volts ≥ 11	10 sec once all enable conds are met	
					Time since gear change	≥ 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -20 °C		
					Vehicle speed	≤ 2 mph		
					Commanded RPM delta	≤ 25 rpm		
					Idle time	> **5** sec		
						PTO not active Transfer Case not in 4WD LowState		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						On-vehicle device control (service bay control) must not be active. following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimit AND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) AmbientAirDefault ECT_Sensor_FA EngCoolHot EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA EnginePowerLimited TPS_FA TPS_Performance_FA 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	< -**188**.00 rpm 0.0035	No active DTCs Baro Coolant Temp	> 70 kPa > 60 °C	Diagnostic runs in every 12.5 ms 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 time	≥ 60 sec	Diagnostic reports pass or fail in	
					Ignition voltage	32 ≥ volts ≥ 11	10 sec once all enable conds are met	
					Time since gear change	≥ 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -20 °C		
					Vehicle speed	≤ 2 mph		
					Commanded RPM delta	≤ 25 rpm		
					Idle time	> **5** sec		
						PTO not active Transfer Case not in 4WD LowState		
						Off-vehicle device control (service bay control) must not be active.		
						following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimit AND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion)		
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						IgnitionOutputDriver_FA EnginePowerLimited TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFault LowFuelConditionDiagnostic ClchPstnEmisFA ClchToT_TypedABC		
Cold Start Rough Idle	P050D	Monitors the combustion performance when the cold start emission reduction strategy is active by accumulating and determining the percentage of engine cycles that have less than complete combustion relative to the total number of engine cycles in which Dual Pulse is active.	Deceleration index vs. Engine Speed Vs Engine load Deceleration index calculation is tailored to specific veh. Tables used are 1st tables encountered that are not max of range. Undetectable region at a given speed/load point is where all tables are max of range point. see Algorithm Description Document for additional details.	Incomplete combustion identified by P0300 threshold tables: (>Idle SCD AND >Idle SCD ddt Tables) OR (>Idle Cyl Mode AND > Idle Cyl Mode ddt Tables)	**Misfire Algorithm Enabled (Refer to P0300 for Enablement Requirements)**		Runs once per trip when the cold start emission reduction strategy is active and Dual Pulse is enabled and active. Frequency: Engine Cycle Test completes after Dual Pulse is no longer active OR The first 500 engine cycles have	Type A 1 Trip(s)
					To enable the diagnostic, the Cold Start Emission Reduction Strategy Must Be Active per the following:			
					Catalyst Temperature	< **100.00** degC		
					AND			
					Engine Coolant	> -10.00 degC		
					In addition, Dual Pulse Strategy Is Enabled and Active Per the following:			
					Engine Speed	> **450.00** RPM		
					Engine Speed	<= **2200.00** RPM		
					Barometric Pressure	>= **70.00** Kpa		
					For the engine speeds and loads in which Dual Pulse is active:			
					Dual Pulse Error induced misfires percentage	>= catalyst damaging misfire		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Dual Pulse Error induced misfires percentage	< 90% of the maximum achieveable catalyst damaging misfire.		
					Engine Cycles	>= 50		
					Engine Cycles	< 501		
					The Cold Start Emission Reduction strategy must not be exiting. The strategy will exit per the following:			
					Catalyst Temperature	>= **900.00** degC		
					AND			
					Engine Run Time	>= **19.00** seconds		
					OR			
					Engine Run Time	> **19.00** seconds		
					OR			
					Engine Coolant	>= 56.00 degC		
					Dual Pulse Strategy will exit per the following:			
					Engine Speed	> **2400.00** RPM		
					OR			
					Barometric Pressure < **70.00** Kpa			
					Dual Pulse Strategy will also exit if the any of the "Additional Dual Pulse Enabling Criteria" from below are not satisfied.			
					Additional Dual Pulse Enabling Criteria:			
					Green Engine Enrichment	Not Enabled		
					Misfire Converter Protection strategy	not being requested		
					Engine Metal Overtemp strategy	not being requested		
					Fuel control state	Open Loop		
					Output State Control	Not being requested for fuel		
					DOD Or DFCO	Not Active		
					Power Enrichment	Not Active		
					Piston Protection	Not Active		
					Hot Coolant Enrichment	Not Active		
					Injector Flow Test	Not Active		
					General Enable			
					DTC's Not Set			
					GetAPSR_b_PedalFailure			
					ECT_Sensor_FA			
					IAT_SensorCircuitFA			
					IAT2_SensorCircuitFA			
					CrankSensorFaultActive			
					FuelInjectorCircuit_FA			
					MAF_SensorFA			
					MAP_SensorFA			
					AnyCamPhaser_TFTKO			
					Clutch Sensor FA			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					IAC_SystemRPM_FA			
					IgnitionOutputDriver_FA			
					TPS_FA			
					VehicleSpeedSensor_FA			
					TransmissionEngagedState_FA			
					EngineTorqueInaccurate			
					GetFULD_b_InjCktTFTKO			
					GetFPMR_b_FuelPumpRlyCktFA			
					GetFDLV_b_FuelInjCkt_FA			
					GetFHPR_b_FRP_SnsrCkt_FA			
					GetFHPR_b_FRP_SnsrCkt_TFTKO			
					GetFHPR_b_PumpCkt_TFTKO			
					GetFHPR_b_PumpCkt_FA			
Engine Oil Pressure (EOP) Sensor Circuit Low Voltage	**P0522**	**Determines if the Engine Oil Pressure (EOP) Sensor circuit voltage is too low**	**(Engine Oil Pressure Sensor Circuit Voltage) / 5 Volts**	**< 5 percent**	**Engine Running** **Ignition Voltage** **Sensor Present** **Diagnostic enabled/disabled**	**= True** **<= 32.0 V and >= 11.0 V** **Yes** **Enabled**	**50 failures out of 63 samples** **Performed every 100 msec**	**1 trip(s)** **Type C**
Engine Oil Pressure (EOP) Sensor Circuit High Voltage	**P0523**	**Determines if the Engine Oil Pressure (EOP) Sensor circuit voltage is too high**	**(Engine Oil Pressure Sensor Circuit Voltage) / 5 Volts**	**> 85 percent**	**Engine Running** **Ignition Voltage** **Sensor Present** **Diagnostic enabled/disabled**	**= True** **<= 32.0 V and >= 11.0 V** **Yes** **Enabled**	**204 failures out of 254 samples** **Performed every 100 msec**	**1 trip(s)** **Type C**
System Voltage Low	P0562	This DTC determines if the current system voltage is below the minimum required voltage for proper ECM operation	System voltage	≤ 9 volts	Ignition is “ON” Engine Speed	 ≥ 400 RPM	5 failures out of 6 samples 1 second / sample Continuous	1 trip Type C
System Voltage High	P0563	This DTC determines if the current system voltage is above the maximum allowed voltage for proper ECM operation	System voltage	≥ 18 volts	Ignition is “ON”		5 failures out of 6 samples 1 second / sample Continuous	1 trip Type C
Cruise Control Mutil-Functon Switch Circuit	P0564	Detect when cruise control multi-function switch circuit (analog) voltage is in an illegal range	Cruise Control analog circuit voltage must be in an "illegal range" for greater than a calibratable period of time for cruise switch states that are received over serial data		CAN cruise switch diagnostic enable in ECM	**-1.0 X**	fail continuously for greater than **0.700** seconds	Type: C MIL: NO Trips: 1

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Cruise Control Resume Circuit	P0567	Detects a failure of the cruise resume switch in a continously applied state	Cruise Control Resume switch remains applied for greater than a calibratable period of time for architecture where cruise switch states are received over serial data		CAN cruise switch diagnostic enable in ECM	TRUE -1	fail continuously for greater than 90.000 seconds	Type: C MIL: NO Trips: 1
Cruise Control Set Circuit	P0568	Detects a failure of the cruise set switch in a continously applied state	Cruise Control Set switch remains applied for greater than a calibratable period of time for architecture where cruise switch states are received over serial data		CAN cruise switch diagnostic enable in ECM	TRUE -1	fail continuously for greater than 90.000 seconds	Type: C MIL: NO Trips: 1
Cruise Control Input Circuit	P0575	Detects rolling count or protection value errors in Cruise Control Switch Status serial data signal	If x of y rolling count / protection value faults occur, disable cruise for duration of fault		Cruise Control Switch Serial Data Error Diagnostic Enable	TRUE **-1**	10/16 counts	Type: C MIL: NO Trips: 1
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if the calibration check sum is incorrect or the flash memory detects an uncorrectable error via the Error Correcting Code.	1) The Primary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1) 1 failure if the fault is detected during the first pass. 5 failures if the fault occurs after the first pass is complete.			1) Diagnostic runs continuously in the background	Type: A MIL: YES Trips: 1
			2) The Primary Processor's Error Correcting Code hardware in the flash memory detects an error. Covers all software and 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.	
			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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
				In all cases, the failure count is cleared when controller shuts down				
Control Module Not Programmed	P0602	This DTC will be stored if the PCM is a service PCM that has not been programmed.	Output state invalid		PCM State	= crank or run	Diagnostic runs at powerup	Type A 1 trips
						PCM is identified through calibration as a Service PCM		
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up does not match checksum at power-down				Diagnostic runs at powerup	Type A 1 trips
							Diagnostic reports a fault if 1 failure occurs	
ECM RAM Failure	P0604	Indicates that the ECM has detected a RAM fault						Type: A MIL: YES Trips: 1
Primary Processor System RAM Fault			Indicates that the primary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
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)	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Primary Processor Update Dual Store RAM Fault			Indicates that the primary processor detects a mismatch between the data and dual data is found during RAM updates. Detects a mismatch in data and dual data updates >	0.16363 seconds			When dual store updates occur.	
Primary Processor Write Protected RAM Fault			Indicates that the primary processor detects an illegal write attempt to protected RAM. Number of illegal writes are >	65534 counts			Diagnostic runs continuously (background loop)	
Secondary Processor RAM Fault			Indicates that the secondary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	5 counts			Will finish first memory scan within 30 seconds at all engine conditions, diagnostic runs continuously (background loop)	
ECM Processor	P0606	Indicates that the ECM has detected an internal processor integrity fault						Type: A MIL: YES Trips: 1
Primary Processor SPI Fault Detected		Loss or invalid message of SPI communication from the Secondary Processor at initialization detected by the Primary Processor or loss or invalid message of SPI communication from the Secondary Processor after a valid message was 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 > **6.00** and reduced power is false, else the failure will be reported for all conditions	In the primary processor, 159/399 counts intermittent or 39 counts continuous; 39 counts continuous @ initialization	
Secondary Processor SPI Fault Detected		Loss or invalid message of SPI communication from the Primary Processor at initialization detected by the Secondary Processor or loss or invalid message of SPI communication from the Primary Processor after a valid message was recieved by the Secondary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was recieved				In the secondary processor, 20/200 counts intermittent or 0 counts continuous; 0 counts continuous @ initialization	
Secondary Processor Stack Fault		Checks for stack over or underflow in secondary processorby looking for corruption of known pattern at stack boundaries	Checks number of stack over/under flow since last powerup reset >=	5		KeMEMD_b_StackLimitTestEnbl == 1 Value of KeMEMD_b_StackLimitTestEnbl is: 1.	variable, depends on length of time to corrupt stack	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Secondary processor received incorrect Keys		MAIN processor is verified by responding to a seed sent from the secondary with a key response to secondary	Checks number of incorrect keys received > or Secondary processor has not received a new within time limit	2 incorrect seeds within 8 messages, 0.200 seconds		ignition in Run or Crank	150 ms for one seed continually failing	
MAIN processor did not receive seed within time limit		MAIN processor did not receive seed within time limit	Time >	**0.500** seconds		always running	**0.500** seconds	
MAIN processor receives seed in wrong order		MAIN processor test for seeds to arrive in a known sequence	X out of Y	3 out of 17		always running	3* 50 ms	
Secondary processor ALU check		Verify secondary processor correctly performs know calculation. Verify the integrity of all general purpose registers	2 fails in a row			KePISD_b_ALU_TestEnbld == 1 Value of KePISD_b_ALU_TestEnbld is: 1.	12.5 ms	
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	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_ConfigReg	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. KePISD_b_12p5msSeqTestEnbld== 1 Value of KePISD_b_12p5msSeqTestEnbld is: 1	Error > 5 times of loop time; loop times are 6.25, 12.5, 25 ms in the main processor	
Processor Performance Check - ETC software is not completing background task			Software background task first pass time to complete >	360.000 seconds	Powertrain relay	> **6.00** V	30 s	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
MAIN processor ALU check		Verify MAIN processor correctly performs know calculation. Verify the integrity of all general purpose registers	2 fails in a row			KePISD_b_ALU_TestEnbld == 1 Value of KePISD_b_ALU_TestEnbld is: 1.	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.	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	variable, depends on length of time to access flash with corrupted	
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_EC	variable, depends on length of time to access flash with corrupted	
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.	variable, depends on length of time to write flash to RAM	
Starter Relay Control Circuit	P0615	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms / sample Continuous	1 trip Type C
Fuel Pump Relay Control Circuit Open	**P0627**	**This DTC checks for an open and shorted high circuit while the device is commanded off.**	**The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.**		**Run/Crank Voltage** **Engine Speed**	**11 volts ≤ Voltage ≤ 32 volts** **≥ 0 RPM**	**8 failures out of 10 samples** **250 ms /sample** **Continuous with device off**	**2 trips Type B**
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		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms /sample	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Voltage			circuit do not match.				Continuous with device on	
Fuel Pump Relay Control Circuit High Voltage	P0629	This DTC checks for an open and shorted high circuit while the device is commanded off.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Engine Speed	11 volts ≤ Voltage ≤ 32 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms /sample Continuous with device off	2 trips Type B
Internal Control Module Fuel Injector Control Performance	P062B	This DTC checks the circuit for electrical integrity during operation.	Internal ECU Boost Voltage OR Internal ECU Boost Voltage OR Driver Status OR	≥ 90 Volts ≤ 40 Volts = Not Ready	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	1 trips Type A
Control Module EEPROM Error	P062F	Indicates that the NVM Error flag has not been cleared	The next write to NVM will not succeed or the assembly calibration integrity check failed.		Ignition State	= unlock/accesory, run, or crank	1 test failure Diagnostic runs once at powerup	Type A 1 trips
VIN Not Programmed or Mismatched - Engine Control Module (ECM)	P0630	This DTC checks VIN is correctly written	At least one of programed VIN's digit	= 00 or FF	OBD Manufacturer Enable Counter	= 0	250 ms / test Continuous	Type A 1 trips
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 > **6.00** and reduced power is false, else the failure will be reported for all conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
								Trips: 1
Air Conditioning Clutch Relay Control Circuit	**P0645**	**This DTC checks the circuit for electrical integrity during operation.**	**The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.**		**Run/Crank Voltage** **Engine Speed**	**11 volts ≤ Voltage ≤ 32 volts** **≥ 400 RPM**	**20 failures out of 25 samples** **250 ms / sample** **Continuous**	**1 trip Type C**
Malfunction Indicator Lamp (MIL) Control Circuit (ODM)	P0650	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Run/Crank Voltage Remote Vehicle Start is not active	11 volts ≤ Voltage ≤ 32 volts	20 failures out of 25 samples 250 ms / sample Continuous	2 trip Type B NO MIL
5 Volt Reference #2 Circuit	P0651	Detects a continuous or intermittent short on th 5 volt reference circuit #2	ECM Vref2 < or ECM Vref2 >	4.875 5.125		Run/Crank voltage or Powertrain relay voltage > **6.00** and reduced power is false, else the failure will be reported for all conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
Intake Manifold Tuning (IMT) Valve Solenoid Control Circuit Bank 1	**P0660**	**Electrical Integrity of Intake Manifold Tuning (IMT) Valve Control Circuitry**	**ECM detects that commanded and actual states of output driver do not match**		**Powertrain Relay Voltage** **Powertrain Relay Voltage** **Engine Speed**	**>= 11.00 Volts** **<= 32.00 Volts** **>= 99999 RPM**	**999 failures out of 0 samples** **1 sample every 12.5 msec**	**Type X** **0 trips**
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 Low	**P0689**	**This DTC is a check to determine if the Powertrain relay is functioning properly.**	**PT Relay feedback voltage is**	**≤ 5 volts**	**Run/Crank Voltage** **Powertrain relay commanded "ON"** **No active DTCs:**	**≥ 11 volts** **PowertrainRelayStateOn_FA**	**5 failures out of 6 samples** **1second / sample**	**0 trips Type X**
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	≥ 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	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			when commanded 'OFF'				Continous failures ≥ 2 seconds	
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on th 5 volt reference circuit #1	ECM Vref3 <	4.875		Run/Crank voltage or Powertrain relay voltage > **6.00** and reduced power is false, else the failure will be reported for all conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
			or ECM Vref3 >	5.125				
5 Volt Reference #4 Circuit	P06A3	Detects a continuous or intermittent short on th 5 volt reference circuit #2	ECM Vref4 <	4.875		Run/Crank voltage or Powertrain relay voltage > 6.00 and reduced power is false, else the failure will be reported for all conditions	19/39 counts or 0.1875sec continuous; 12.5 msec/count in main processor	Type: A MIL: YES Trips: 1
			or ECM Vref4 >	5.125				
Internal Control Module Knock Sensor Processor 1 Performance	P06B6	This diagnostic checks for a fault with the internal test circuit used only for the '20 kHz' method of the Open Circuit Diagnostic	Gated FFT Diagnostic Output (VaKNKD_k_OpenTestCktIntFilter[0])	> OpenTestThreshLo **and** < OpenTestThreshHi See Supporting Tables	Diagnostic Enabled (1 = Enabled) Engine Speed Engine Air Flow	= 1 > 400 RPM and < **4000** RPM ≥ 50 mg/cylinder and ≤ 2000 mg/cylinder	First Order Lag Filter with Weight Coefficient Weight Coefficient = **0.0200** Updated each engine event Max time to set = 10 seconds	Type: B MIL: YES Trips: 2
Internal Control Module Knock Sensor Processor 2 Performance	**P06B7**	**This diagnostic checks for a fault with the internal test circuit used only for the '20 kHz' method of the Open Circuit Diagnostic**	**Gated FFT Diagnostic Output (VaKNKD_k_OpenTestCktIntFilter[1])**	**> OpenTestThreshLo and < OpenTestThreshHi See Supporting Tables**	**Diagnostic Enabled (1 = Enabled) Engine Speed Engine Air Flow**	**= 1 > 400 RPM and < 4000 RPM ≥ 50 mg/cylinder and ≤ 2000 mg/cylinder**	**First Order Lag Filter with Weight Coefficient Weight Coefficient = 0.0200**	**Type: B MIL: YES Trips: 2**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							Updated each engine event **Max time to set = 10 seconds**	
Fuel Pump Control Module (FPCM) Requested MIL Illumination	P069E	Monitors the FPCM MIL request line to determine when the FPCM has detected a MIL illuminating fault.	Fuel Pump Control Module Emissions-Related DTC set			Time since power-up > 3 seconds	Continuous	Type A 1 trips MIL: NO
Clutch Pedal Position Sensor Circuit Range / Performance	**P0806**	**Detects if Clutch Pedal Position Sensor is Stuck in a range indicative of a vehicle NOT in gear, when the vehicle is determined to be in gear.**	**Filtered Clutch Pedal Position Error when the vehicle is determined to be in gear.**	**> 5 %**	**N/V Ratio must Match Actual Gear (i.e. vehicle in gear)** **Transfer Case not in 4WD Low range** **Engine Torque** **Clutch Pedal Position**	**vehicle speed > 6 MPH** **> EngTorqueThreshold Table** **< ResidualErrEnableLow Table** ***> ResidualErrEnableHigh Table***	**25 ms loop Continuous**	**1 trip(s)** **Type A**
				disable conditions:	**No active DTCs:**	**ClutchPositionSensor CktLo FA** **ClutchPositionSensor CkitHi FA** **CrankSensorFA** **TOS FA** **VehicleSpeedSensor_FA**		
Clutch Pedal Position Sensor Circuit Low	**P0807**	**Detects Continuous Circuit Short to Low or Open**	**Clutch Position Sensor Circuit**	**< 4 % of Vref** **disable conditions:**	**Engine Not Cranking System Voltage** **No active DTCs:**	**> 11.0 Volts** **5VoltReferenceB_FA**	**200 failures out of 250 samples** **25 ms loop Continuous**	**1 trip(s)** **Type A**
Clutch Pedal Position Sensor Circuit High	**P0808**	**Detects Continuous Circuit Short toHigh**	**Clutch Position Sensor Circuit**	**> 96 % of Vref** **disable conditions:**	**Engine Not Cranking System Voltage** **No active DTCs:**	**> 11.0 Volts** **5VoltReferenceB_FA**	**200 failures out of 250 samples** **25 ms loop Continuous**	**1 trip(s)** **Type A**
Clutch Pedal Position Not	**P080A**	**Monitor for Valid Clutch Pedal Fully Applied Learn Position**	**Fully Applied Learn Position**	**> 9.0 or < 36.0**	**Clutch Pedal Position Not Learned**		**250 ms loop Continuous**	**1 trip(s)**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Position Not Learned		**values**	**OBD Manufacturer Enable Counter**	**= 0**				**Type A**
Traction Control Torque Request Circuit	P0856	Determines if torque request from the EBTCM is valid	Serial Communication 2's complement message - ($140 for PPEI2 or $1C9 for PPEI3, $1CA for Hybrid))	Message <> 2's complement of message	Serial communication to EBTCM (U0108) Power Mode Engine Running Status of traction in GMLAN message ($4E9)	No loss of communication = Run = True = Traction Present	**All except Class2 PWM:** Count of 2's complement values not equal >= **10** **6** rolling count failures out of 10 samples >= **3** multi-transitions out of 5 samples >= 4 out of 10 samples **above 250 Nm for engine based traction torque system, 4000 Nm for axle based traction torque system** Performed every **25** msec	1 trip(s) Type C
			OR					
			Serial Communication message ($140 for PPEI2 or $1C9 for PPEI3, $1CA for Hybrid)) rolling count value	Message rolling count value <> previous message rolling count value plus one				
			OR					
			Too many minimum limit torque request transitions occur from TRUE to FALSE to TRUE within a time period Torque request greater than allowed	Requested torque intervention type toggles from not increasing request to increasing request				
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	<= **350** kPa*(g/s) > **16** grams/sec > **20.0** 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 > **-7** Deg C < **127** Deg C > -20 Deg C < 125 Deg C >= 0.00 Filtered Throttle Model Error multiplied by TPS Residual Weight Factor based on RPM	Continuous Calculation are performed every 12.5 msec	Type B 2 trips

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			ABS(Measured MAP – MAP Model 2) Filtered	> **20.0** kPa		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".		
					No Active DTCs:	MAP_SensorCircuitFA EGRValve_FP 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)	No Active DTC's	TPS_ThrottleAuthority Defaulted MAP_SensorFA IAT_SensorFA ECT_Sensor_FA IAT_SensorFA MAF_SensorFA EvapPurgeSolenoidCircuit_FA	Sample time is 60 seconds Frequency: Once per trip Green Sensor Delay Criteria	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
				OR S/T L/R switches < **3**, or S/T R/L switches < **3**		EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA FuelTankPressureSnsrCkt_FA FuelInjectorCircuit_FA AIR System FA EthanolCompositionSensor_FA EngineMisfireDetected_FA	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					Bank 1 Sensor 1 DTC's not active System Voltage EGR Device Control Idle Device Control Fuel Device Control AIR Device Control Low Fuel Condition Diag Green O2S Condition O2 Heater on for Learned Htr resistance Engine Coolant IAT Engine run Accum Time since any AFM status change Time since Purge On to Off change Time since Purge Off to On change Purge duty cycle Engine airflow Engine speed Fuel Baro Air Per Cylinder Low Fuel Condition Diag Fuel Control State Closed Loop Active	= P0131, P0132 or P0134 10.0 volts < system voltage< 32.0 volts = Not active = Not active = Not active = Not active = False = Not Valid >= **60** seconds = Valid > **65** ºC > -40 ºC > **60** seconds > **0.0** seconds > **4.0** seconds > **4.0** seconds >= 0 % duty cycle **15** gps <= engine airflow <= **55** gps 1000 <= RPM <= **3300** < 87 % Ethanol > 70 kpa >= **125** mGrams = False = Closed Loop = TRUE		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					LTM fuel cell	= Enabled		
					Transient Fuel Mass	<= 100.0 mgrams		
					Baro	= Not Defaulted		
						not = Power		
					Fuel Control State	Enrichment		
					Fuel State	DFCO not active		
					Commanded Proportional Gain	>= 0.0 %		
					All of the above met for			
					Time	> **2.0** seconds		
O2S Insufficient Switching Bank 2 Sensor 1	**P1153**	**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 "P1153 - O2S HC L to R Switches Limit Bank 2 Sensor 1" Pass/Fail Threshold table & "P1153 - O2S HC R to L Switches Limit Bank 2 Sensor 1" Pass/Fail Threshold table in Supporting tables tab)** **OR** **S/T L/R switches < 3, or S/T R/L switches < 3**	**No Active DTC's**	**TPS_ThrottleAuthorityDefaulted** **MAP_SensorFA** **IAT_SensorFA** **ECT_Sensor_FA** **IAT_SensorFA** **MAF_SensorFA** **EvapPurgeSolenoidCircuit_FA** **EvapFlowDuringNonPurge_FA** **EvapVentSolenoidCircuit_FA** **EvapSmallLeak_FA** **EvapEmissionSystem_FA** **FuelTankPressureSnsrCkt_FA** **FuelInjectorCircuit_FA** **AIR System FA** **EthanolCompositionSensor_FA** **EngineMisfireDetected_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 cycle).** **Note: This feature is only**	**2 trips Type B**
					Bank 2 Sensor 1 DTC's not active	**= P0151, P0152 or P0154**		
					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**		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Green O2S Condition O2 Heater on for Learned Htr resistance Engine Coolant IAT Engine run Accum Time since any AFM status change Time since Purge On to Off change Time since Purge Off to On change Purge duty cycle Engine airflow Engine speed Fuel Baro Air Per Cylinder Low Fuel Condition Diag Fuel Control State Closed Loop Active LTM fuel cell Transient Fuel Mass Baro Fuel Control State Fuel State Commanded Proportional Gain All of the above met for Time	= Not Valid >= 60 seconds = Valid > 65 ºC > -40 ºC > 60 seconds > 0.0 seconds > 4.0 seconds > 4.0 seconds >= 0 % duty cycle 15 gps <= engine airflow <= 55 gps 1000 <= RPM <= 3300 < 87 % Ethanol > 70 kpa >= 125 mGrams = False = Closed Loop = TRUE = Enabled <= 100.0 mgrams = Not Defaulted not = Power Enrichment DFCO not active >= 0.0 % > 2.0 seconds	enabled when the vehicle is new and cannot be enabled in service	
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 ≥ **0** 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 ≥ **0** 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 ≥ **0** Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Injector 4 low side circuit shorted to 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 ≥ **0** Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 5 low side circuit shorted to high side circuit	**P124C**	**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 ≥ 0 Sec P062B not FA or TFTK**	**10 failures out of 20 samples 100 ms /sample Continuous**	**1 trips Type A**
Injector 6 low side circuit shorted to high side circuit	**P124D**	**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 ≥ 0 Sec P062B not FA or TFTK**	**10 failures out of 20 samples 100 ms /sample Continuous**	**1 trips Type A**
EngineMetal OvertempActive	**P1258**	**The objective of the algorithm is to protect the engine in the event of engine metal overtemperature, mainly due to loss of coolant**	**Engine Coolant For**	**≥ 129 °C ≥ 2 seconds**	**Engine Run Time If feature was active and it set the coolant sensor fault then feature will be enabled on coolant sensor fault pending on the next trip.**	**≥ 30 Seconds**	**Fault present for ≥ 0 seconds**	**1 trips Type A**
Ignition Coil Positive Voltage Circuit Group 1	P135A	This diagnostic checks for voltage supply to the Ignition Coils (applicable only for SIDI applications)	Ignition Module Supply Voltage.	< 2.5 Volts	Diagnostic Enabled/Disabled	Enabled	50 Failures out of 63 Samples 6.25 msec rate	Type: A MIL: YES Trips: 1
					Delay Enabled/Disabled	Disabled		
					Delay time starting at Ignition-On	**0** (msec)		
Ignition Coil Positive Voltage Circuit Group 2	**P135B**	**This diagnostic checks for voltage supply to the Ignition Coils (applicable only for SIDI applications)**	**Ignition Module Supply Voltage.**	**< 2.5 Volts**	**Diagnostic Enabled/Disabled**	**Enabled**	**50 Failures out of 63 Samples 6.25 msec rate**	**Type: A MIL: YES Trips: 1**
					Delay Enabled/Disabled	**Disabled**		
					Delay time starting at Ignition-On	**0 (msec)**		

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 (EWMA filtered)	< -32.00 KJ/s (high RPM failure mode) > **4.20** 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	< **100.00** 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	>= **900.00** degC		
					AND			
					Engine Run Time	>= **19.00** seconds		
					OR			
					Engine Run Time	> **19.00** seconds		
					OR			
					Engine Coolant	>= 56.00 degC		
					Other Enable Criteria			
					Vehicle Speed	< **3** 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	> **2.00** seconds		
					the diagnostic will continue the calculation.			
					Clutch Pedal Position	< **25.00** pct		
					Clutch Pedal Position	> **88.00** pct		
					Idle Speed Control System	Active		
					General Enable			
					DTC's Not Set			
					GetAPSR_b_PedalFailure			
					ECT_Sensor_FA			
					IAT_SensorCircuitFA			
					IAT2_SensorCircuitFA			
					CrankSensorFaultActive			
					FuelInjectorCircuit_FA			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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	0	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 > **6.00** and reduced power is false, else the failure will be reported for all conditions	0.49 ms	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 SIDI High Pressure Pump current monitor	P163A	This DTC checks the current from the control area and compares it with calibrated thresholds to set current high and low flags	SIDI fuel pump High Current Test Current SIDI fuel pump Low Current Test Current	 ≥ 3.00 Amps ≤ 0.10 Amps	Battery Voltage Low Pressure Pump Engine Run Time Additional Enable Conditions: All must be true (High Pressure Pump is enabled and High Fuel pressure sensor ckt is Not (FA,FP or TFTKO) and High Pressure fuel pump ckt is Not (FA,FP or TFTKO) and Cam or Crank Sensor Not FA and IAT,IAT2,ECT Not FA and Low side Fuel Pump Relay ckt Not FA and Estimate fuel rail pressure is valid and Green Engine (In assembly plant) is not enabled and Not if low fuel condition and Low side Fuel Pump is on and Injector Flow Test is not active and Device control commanded pressure is false and Device control pump ckt enabled on is false and Engine movement detected is true and Manufacturers enable counter is 0) Flex Fuel Sensor Not FA Ignition voltage out of correlation error(P1682) not active	11 <= Volts <= 32 > 0.275 MPa >= KtFHPD_t_PumpCntrlEngRunThrsh(see supporting tables) Enabled when a code clear is not active or not exiting device control Engine is not cranking	Current High - 750 failures out of 938 samples Current Low - 750 failures out of 938 Samples	2 trips Type B
Ignition Voltage Correlation	P1682	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the	|Run/Crank – ETC Run/Crank| >	3.00 Volts	Powertrain commanded on and		240/480 counts or 0.1750sec continuous; 12.5	Type: A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		Powertrain Relay Ignition Voltage			Run/crank voltage > or ETC Run/crank voltage > and Run/crank voltage >	Table, f(IAT). See supporting tables 5.5 5.5		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	**84.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Engine min capacity above threshold	**85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer **97** ms continuous, 0.5 down time	
			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 **151** ms continuous, 0.5 down time multipier	
			Absolute difference of adjustment factor based on temperature and its dual store above threshold	**5.30** m/s		Ignition in unlock/accessory, run or crank	Up/down timer **133** 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 **210** RPM		Engine speed greater than 0rpm	Up/down timer **151** ms continuous, 0.5 down time multipier	
			After throttle blade pressure and its dual store do not match	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			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	
			Engine oil temperature and its dual store do not equal	N/A		Ignition in unlock/accessory, run or crank	Up/down timer **315** 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 position greater than redundant calculation plus threshold	**7.00** percent		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of the rate limited pre-throttle pressure and its redundant calculation greater than threshold	**1.58** kpa		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Throttle desired torque above desired torque plus threshold	**85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Desired filtered throttle torque exceeds the threshold plus the higher of desired throttle torque or modeled throttle torque	**85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque feedback proportional term is out of allowable range or its dual store copy does not match	High Threshold **42.50** Nm Low Threshold -**42.50** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque feedback integral term magnitude or rate of change is out of allowable range or its dual store copy does not match	High Threshold **79.69** Nm Low Threshold **-85.00** Nm Rate of change threshold **5.31** 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 **85.00** Nm Low Threshold **-85.00** 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	
			Difference of torque model coefficients and its redundant calculation is out of bounds given by threshold range	High Threshold **0.0002421** Low Threshold **-0.0002421**		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 **85.00**Nm Low Threshold **-85.00**Nm		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 **85.00** Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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 **85.00** Nm Low Threshold **-85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Generator friction torque is out of bounds given by threshold range	High Threshold **85.00** Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Supercharger friction torque is out of bounds given by threshold range	High Threshold **85.00** Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Filtered Torque error magnitude or its increase rate of change is out of allowable range or its dual store copy does not match	High Threshold **85.00** Nm Low Threshold **-85.00** Nm Rate of change threshold **5.31** Nm/loop		Engine speed >0rpm MAF, MAP and Baro DTCs are false	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Torque error compensation is out of bounds given by threshold range	High Threshold 85.00 Nm Low Threshold 0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Delta Torque Baro compensation is out of bounds given by threshold range	High Threshold **4.34** Nm Low Threshold		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			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) **84.00** Nm 2) NA 3) **84.00** Nm 4) **84.00** Nm		1&2) Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > **85.00** Nm 3&4) 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.
			Absolute difference of the calculated spark offset for equivalence ratio and its redundant calculation greater than threshold	7.84 degrees		Engine speed >0rpm	Up/down timer 151 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 **151** ms continuous, 0.5 down time multipier	
			Min. Axle Torque Capacity is greater than threshold	0.00 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Predicted torque for zero pedal determination is greater than calc'ed limit.	Table, f(Engine, Oil Temp). See supporting tables + **85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Commanded Predicted Axle Torque and its dual store do not match	1 Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			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	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	**7.84** degrees		Ignition in unlock/accessory, run or crank	Up/down timer **151** ms continuous, 0.5 down time multipier	
			Difference of commanded spark advance and adjusted delivered is out of bounds given by threshold range	**7.84** degrees		Engine speed >0rpm	Up/down timer **151** ms continuous, 0.5 down time multipier	
			Estimated Engine Torque and its dual store are not match	**85.00** Nm		Engine speed >0rpm	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.
			Estimated Engine Torque without reductions due to torque control and its dual store are not match	**85.00** Nm		Engine speed >0rpm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference of desired spark advance for managed torque and its redundant calculation is out of bounds given by threshold range	**7.84** degrees		Torque reserve (condition when spark control greater than optimum to allow fast transitions for torque disturbances) > **85.00**	Up/down timer **451** 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	**85.00** Nm		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multipier	
			One step ahead calculation of air-per-cylinder and its dual store do not match	**106.72** mg		Engine speed >0rpm	Up/down timer **151** 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 > 550rpm	Up/down timer 151 ms continuous, 0.5 down time multipier	
			Rate limited cruise axle torque request and its dual store do not match	**138.63** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 163 ms continuous, 0.5 down time	
			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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Commanded axle torque is greater than its redundant calculation by threshold	**1109.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded axle torque is less than its redundant calculation by threshold	-65535.00 Nm		Ignition in unlock/accessory, run or crank Redundant commanded axle torque < --65535.00 Nm	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded engine torque due to fast actuators and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Commanded engine torque due to slow actuators and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			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 < **4800.00** or **5000.00** rpm (hysteresis pair)	Up/down timer **151** ms continuous, 0.5 down time multipier	
			Rate limited vehicle speed and its dual store do not equal	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	255/16 counts; 25.0msec/count FWD Apps only	
			Throttle progression mode and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

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 is out of bounds given by threshold range	High Threshold 1.10 T/C Range Hi 0.10 T/C Range Lo Low Threshold 1.10 T/C Range Hi 0.10 T/C Range Lo		Ignition in unlock/accessory, run or crank	255/6 counts; 25.0msec/count	
			TOS to wheel speed conversion factor and its dual store do not equal	NA		Ignition in unlock/accessory, run or crank	255/6 counts; 25.0msec/count	
			Cylinders active greater than commanded	**3** cylinders		Engine run flag = TRUE > 2.00s Number of cylinder events since engine run > 24 No fuel injector faults active	Up/down timer **151** ms continuous, 0.5 down time multipier	
			Absolute difference of Friction torque and its redundant calculation is out of bounds given	**85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			Absolute difference of Accessory torque and its redundant calculation is out of bounds given by threshold range	**85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Absolute difference of Filtered Air-per-cylinder and its redundant calculation is out of bounds given by threshold range	**106.72** 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	**7.84** degrees		Engine speed >0rpm	Up/down timer **151** ms continuous, 0.5 down time multipier	
			Desired Throttle Area calculated does not equal its redundant calculation	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			Equivance Ratio torque compensation exceeds threshold	-**85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Absolute difference between Equivance Ratio torque compensation and its dual store out of bounds given bt threshold	**85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Commanded Predicted Engine Torque and its dual store do not match	N/A		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Zero pedal axle torque is out of bounds given by threshold range	High Threshold **1109.00** Nm Low Threshold		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			Torque Learn offset is out of bounds given by threshold range	High Threshold 0.00 Nm Low Threshold		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			One step ahead calculation of air-per-cylinder and two step ahead is greater than threshold	80.00 mg		Engine speed >**550**rpm	Up/down timer **451** ms continuous, 0.5 down time multipier	
			Difference between Unmanaged Spark and PACS Spark is greater than threshold	**7.84** degrees		Ignition in unlock/accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Predicted torque for uncorrected zero pedal determination is greater than calc'ed limit.	Table, f(Engine, Oil Temp). See supporting tables + **85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			Idle speed control calculated predicted minimum torque request exceeds calculated torque limit	Table, f(Engine, Oil Temp). See supporting tables + **85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated	Table, f(Engine, Oil Temp). See supporting tables + **85.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			Difference between Driver Requested Immediate Torque primary path and its secondary	**1109.00** Nm		Ignition in unlock/accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time	
			Engine Speed Lores Intake Firing (event based) calculation does not equal its redundant calculation	N/A		Engine speed greater than 0rpm	Up/down timer 151 ms continuous, 0.5 down time	
			Engine Speed Lores Intake Firing timing (event based) calculation does not equal its redundant calculation	N/A		Engine speed greater than 0rpm	Up/down timer **151** ms continuous, 0.5 down time multipier	
			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	
Fuel Level Sensor 2 Performance	**P2066**	**This DTC will detect a fuel sender stuck in range in the secondary fuel tank.**			**Engine Running** **No active DTCs:**	**VehicleSpeedSensor_FA**	**250 ms / sample** **Continuous**	**2 trips Type B**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Fuel Level in Primary and Secondary Tanks Remains in an Unreadable Range too Long					
			If fuel volume in primary tank is AND Fuel volume in secondary tank and remains in this condition for OR	>= 30.0 liters < 4.5 liters 149 miles				
			During fuel tranfer					
			When the enable conditions are met, 3.0 liters of fuel will be transferred from the secondary tank and 3.0 liters of fuel will be transfered into the primary tank within 25 seconds. There is a short delay of 20 seconds to allow fuel slosh to settle before the fail timer begins. If the secondary tank volume does not decrease by the cal amount but the primary volume does increase by the cal amount after the fail timer has expired, then P2066 sets. OR		Transfer Pump is commanded on No device control for the transfer pump Fuel Volume in Secondary Tank Vehicle Speed	 < 10 liters < 0 kph		
			After a Refuel Event					
			If the primary fuel volume changes by 6 liters from engine “off” to engine “on” the secondary volume should change by 3 liters. Otherwise, OR					
			Distance Traveled without a Secondary Fuel Level Change					
			If the vehicle is driven a distance of 149 miles without the secondary fuel level OR The secondary fuel sender is stuck in the deadband AND If the vehicle is driven a distance of 149 miles without the secondary fuel level changing by 3 liters, then the sender must be stuck.	 > 10 liters.	Volume in Secondary Tank and Volume in Secondary Tank Secondary Full Transfer Pump On Time	>= 5 liters < 10 liters >= 200 seconds		
Fuel Level Sensor 2 Performance	P2066	This DTC will detect a fuel sender stuck in range in the			Engine Running		250 ms / sample	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Performance		**secondary fuel tank.**			**No active DTCs:**	**VehicleSpeedSensor_FA**	**Continuous**	
			Fuel Level in Secondary Tank Remains in an Unreadable Range too Long					
			If fuel volume in primary tank is	**>= 30.0 liters**				
			AND Fuel volume in secondary tank	**< 4.5 liters**				
			and remains in this condition for	**149 miles**				
			OR					
			Fuel Level is in a Readable Range for both Primary and Secondary Tanks too Long					
			Volume in Primary Tank	**< 30 liters**				
			AND Volume in Secondary Tank	**> 5 liters**				
			and remains in this condition for	**18030 seconds**				
			OR					
			Distance Traveled without a Secondary Fuel Level Change					
			If the vehicle is driven a distance of 149 miles without the secondary fuel level changing by 3 liters, then the		**Volume in Secondary Tank**	**>= 4.5 liters**		
Fuel Level Sensor 2 Circuit Low Voltage	**P2067**	**This DTC will detect a fuel sender stuck out of range low in the secondary fuel tank.**	**Fuel level Sender % of 5V range**	**< 10 %**	**Run/Crank Voltage**	**11 volts ≤ Voltage ≤ 32 volts**	**180 failures out of 225 samples** **100 ms / sample** **Continuous**	**2 trips Type B**
Fuel Level Sensor 2 Circuit High Voltage **(For use on vehicles with dual fuel tanks)**	**P2068**	**This DTC will detect a fuel sender stuck out of range low in the secondary fuel tank.**	**Fuel level Sender % of 5V range**	**> 60 %**	**Run/Crank Voltage**	**11 volts ≤ Voltage ≤ 32 volts**	**180 failures out of 225 samples** **100 ms / sample** **Continuous**	**2 trips Type B**
Control Module Throttle Actuator Position Performance	P2101	1) Detect a throttle positioning error	Difference between measured throttle position and modeled throttle position >	**7.67** percent	TPS minimum learn is not active and Throttle is being Controlled and	Run/crank voltage or Powertrain relay voltage > **6.00** and reduced power is false, else the failure will be reported for all conditions	15 counts; 12.5 msec/count in the primary processor	Type: A MIL:

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Difference between modeled throttle position and measured throttle position >	**7.67** percent	(Engine Running or Ignition Voltage > or Ignition Voltage >) Ignition voltage failure is false (P1682)	11 5.5		YES Trips: 1
		2) Detect throttle control is driving the throttle in the incorrect direction or exceed the reduced power limit	Throttle Position >	**43.99** percent	TPS minimum learn is active		2. 11counts; 12.5 msec/count in the primary processor	
			Throttle Position >	**42.99** percent	Reduced Power is True Powertrain relay voltage	> 6.00 Volts		
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 > **6.00** 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 > 6.00 and reduced power is false, else the failure will be reported for all conditions No 5V reference error for # 4 5V reference circuit No P06A3	1. 19/39counts or 14counts continuous; 12.5 msec/count in the main processor	Type: A MIL: YES Trips: 1

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

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 >	**5.000**% offset at min. throttle position with an increasing to 10% (0.5v)at max. throttle position for Main processor.		Run/Crank voltage or Powertrain relay voltage > **6.00** and reduced power is false, else the failure will be reported for all conditions No APP sensor faults P2122, P2123,P2127, P2128	1. 19/39 counts intermittent or 15 counts continuous, 12.5 msec/count in the main processor	Type: A MIL: YES Trips: 1
			2. Difference between the learned PPS1 min and PPS2 min >	5.000% Vref		No 5 V reference DTCs P06A3,P0697		
Injector 1 high side circuit shorted to ground	P2147	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to ground		Battery Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ **0** 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 ≥ **0** 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 ≥ **0** 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 ≥ **0** 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 ≥ **0** Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 3 high side circuit shorted to power	P2154	This DTC checks the circuit for electrical integrity during operation.	The ECM detects that the fuel injector high side is shorted to power		Battery Voltage Engine Run Time	11 ≤ Volts ≤ 32 ≥ **0** 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 ≥ **0** Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Injector 4 high side circuit shorted to 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 ≥ **0** Sec P062B not FA or TFTK	10 failures out of 20 samples 100 ms /sample Continuous	1 trips Type A
Injector 5 high side circuit shorted to ground	**P216B**	**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** **≥ 0 Sec** **P062B not FA or TFTK**	**10 failures out of 20 samples** **100 ms /sample** **Continuous**	**1 trips Type A**
Injector 5 high side circuit shorted to power	**P216C**	**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** **≥ 0 Sec** **P062B not FA or TFTK**	**10 failures out of 20 samples** **100 ms /sample** **Continuous**	**1 trips Type A**
Injector 6 high side circuit shorted to ground	**P216E**	**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** **≥ 0 Sec** **P062B not FA or TFTK**	**10 failures out of 20 samples** **100 ms /sample** **Continuous**	**1 trips Type A**
Injector 6 high side circuit shorted to power	**P216F**	**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** **≥ 0 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	0.955		Run/crank voltage or Powertrain relay voltage > **6.00** and reduced power is false, else the failure will be reported for all conditions	2.0 secs	Type: A MIL: YES Trips: 1
Air Fuel Imbalance Bank 1	P219A	Determines if the air-fuel delivery system is imbalanced by monitoring the pre-catalyst O2 sensor voltage characteristics		> **0.50**	System Voltage ECT Engine speed Mass Airflow PerCent Ethanol Delta O2 voltage during previous 12.5ms **O2 sensor switches** **Quality Factor**	*10 < V < 32 for > 4 seconds* > -20 oC ***950** < rpm < **2750*** ***1** < g/s < **600*** < 87 % > **0.000 and 0.000** **> 0 times during current 2.8 second sample period** **> 0.90 in the current operating region**	Frequency: Continuous Monitoring of O2 voltage signal in 12.5ms loop AFIM Filtered Length Ratio variable is updated after every **2.8** seconds of valid data	Type B 2 Trip(s)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					For DoD equipped vehicles only	**No DoD state change during current 2.8 second sample period.**		
					The AFIM Filtered Length Ratio is determined by calculating the difference between the measured O2 voltage length (accumulated O2 voltage over a 2.8 second period) and an emissions-correlated threshold value, divided by the threshold value, and finally multiplied by a Quality Factor (the latter ranges between 0 and 1, based on robustness to false diagnosis in the current operating region). The resulting ratio is then filtered utilizing a first-order lag filter.			
					The first report is delayed for 15 seconds to allow time for the AFIM Filtered Length Ratio variable to saturate. This minimizes the possibility of reporting a pass before a potential failure could be detected.			
					Closed Loop fueling enabled A Function of Coolant Temperature based on Start-up coolant temp. and a function of Time also based on Start-up coolant temp. **Please see "Supporting Tables" Tab**			
					Fuel System Status	***LONG FT Enabled***		
					Disable Conditions: **MIL not illuminated for DTC's** EngineMisfireDetected_FA MAP_SensorFA MAF_SensorFA ECT_Sensor_FA Ethanol Composition Sensor FA TPS_ThrottleAuthorityDefaulted FuelInjectorCircuit_FA AIR System FA O2S_Bank_1_Sensor_1_FA O2S_Bank_2_Sensor_1_FA EvapPurgeSolenoidCircuit_FA EvapFlowDuringNonPurge_FA EvapVentSolenoidCircuit_FA EvapSmallLeak_FA EvapEmissionSystem_FA			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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**		
Air Fuel Imbalance Bank 2	**P219B**	**Determines if the air-fuel delivery system is imbalanced by monitoring the pre-catalyst O2 sensor voltage characteristics**	**The Bank 2 AFIM Filtered Length Ratio variable exceeds a value of**	**> 0.25**	**System Voltage**	***10 < V < 32 for > 4 seconds***	**Frequency:** **Continuous Monitoring of O2 voltage signal in 12.5ms loop** **AFIM Filtered Length Ratio variable is updated after every 2.8 seconds of valid data.**	**Type B 2 Trip(s)**
					ECT	**> -20 oC**		
					Engine speed	***950 < rpm < 2750***		
					Mass Airflow	***1 < g/s < 600***		
					PerCent Ethanol	**< 87 %**		
					Delta O2 voltage during previous 12.5ms	**> 0.000 and 0.000**		
					O2 sensor switches	**> 0 times during current 2.8 second sample period**		
					Quality Factor	**> 0.90 in the current operating region**		
					For DoD equipped vehicles only	**No DoD state change during current 2.8 second sample period.**		
					The AFIM Filtered Length Ratio is determined by calculating the difference between the measured O2 voltage length (accumulated O2 voltage over a 2.8 second period) and an emissions-correlated threshold value, divided by the threshold value, and finally multiplied by a Quality Factor (the latter ranges between 0 and 1, based on robustness to false diagnosis in the current operating region). The resulting ratio is then filtered utilizing a first-order lag filter.			
					The first report is delayed for 15 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.			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Closed Loop fueling enabled A Function of Coolant Temperature based on Start-up coolant temp. and a function of Time also based on Start-up coolant temp. Please see "Supporting Tables" Tab			
					Fuel System Status	*LONG FT Enabled*		
					Disable Conditions:			
					EngineMisfireDetected_FA			
					MAP_SensorFA			
					MAF_SensorFA			
					ECT_Sensor_FA			
					Ethanol Composition Sensor FA			
					TPS_ThrottleAuthorityDefaulted			
					FuelInjectorCircuit_FA			
					AIR System FA			
					O2S_Bank_1_Sensor_1_FA			
					O2S_Bank_2_Sensor_1_FA			
					EvapPurgeSolenoidCircuit_FA			
					EvapFlowDuringNonPurge_FA			
					EvapVentSolenoidCircuit_FA			
					EvapSmallLeak_FA			
					EvapEmissionSystem_FA			
					FuelTankPressureSensorCircuit_FA			
					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		
Barometric Pressure (BARO) Sensor Performance	P2227	Compares baro sensor to the calculated baro estimate (part throttle calculation or unthrottled MAP)	Difference between baro sensor reading and estimated baro when distance since last estimated baro update OR Difference between baro sensor reading and estimated baro	> 15.0 kPa <= 0.31 miles	No Active DTCs: Engine Run Time	AmbientAirPressCktFA ECT_Sensor_Ckt_FA IAT_SensorFA MAF_SensorFA AfterThrottlePressureFA_NA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA > 0.00 seconds	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.
			reading and estimated baro	> 20.0 kPa when distance since last estimated baro update > 0.31 miles <u>Engine Not Rotating Case:</u> Barometric Pressure < 50.0 kPa OR Barometric Pressure > 115.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 409.6 seconds EngModeNotRunTmErr MAP_SensorFA AAP_SnsrFA_TC SCIAP_SensorFA AAP2_SnsrFA MAP_SensorCircuitFP AAP_SnsrCktFP_TC SCIAP_SensorCircuitFP AAP2_SnsrCktFP	999 failures out of 0 samples 1 sample every 12.5 msec	
Barometric Pressure (BARO) Sensor Circuit Low (non-boosted	P2228	Detects a continuous short to low or open in either the signal circuit or the BARO sensor.	BARO Voltage	< 39.0 % of 5 Volt Range (2.0 Volts = 49.7 kPa)	Engine Run Time	> 0.00 seconds	320 failures out of 400 samples 1 sample every 12.5 msec	Type B 2 trips
Barometric Pressure (BARO) Sensor Circuit Low (boosted	P2228	Detects a continuous short to low or open in either the signal circuit or the BARO sensor.	BARO Voltage	< 0.0 % of 5 Volt Range (0.0 Volts = 0.0 kPa)	Engine Run Time	> 0.00 seconds	999 failures out of 0 samples 1 sample every 12.5 msec	Type B 2 trips
Barometric Pressure (BARO) Sensor Circuit High (non-boosted	P2229	Detects an open sensor ground or continuous short to high in either the signal circuit or the BARO sensor.	BARO Voltage	> 90.0 % of 5 Volt Range (4.5 Volts = 115.0 kPa)	Engine Run Time	> 0.00 seconds	320 failures out of 400 samples 1 sample every 12.5 msec	Type B 2 trips
Barometric Pressure (BARO) Sensor Circuit High (boosted	P2229	Detects an open sensor ground or continuous short to high in either the signal circuit or the BARO sensor.	BARO Voltage	> 100.0 % of 5 Volt Range (5.0 Volts = 0.0 kPa)	Engine Run Time	> 0.00 seconds	999 failures out of 0 samples 1 sample every 12.5 msec	Type B 2 trips
Barometric	P2230	Detects a noisy or erratic	Difference between the current		Vehicle Speed	< 512 KPH	320 failures out	Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Barometric Pressure (BARO) Sensor Circuit Intermittent		**barometric pressure input**	**Baro sensor reading and the previous Baro sensor reading**	**> 10.0 kPa**	**No Active DTCs:**	**AmbientAirPressCktFA ECT Sensor FA IAT SensorFA MAF SensorFA AfterThrottlePressure NA TPS FA TPS_Performance_FA VehicleSpeedSensor Error**	**of 400 samples 1 sample every 12.5 msec**	**2 trips**
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 > **64** 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 Engine Speed to initially enable test Engine Speed range to keep test enabled (after initially enabled) Engine Airflow Vehicle Speed to initially enable test	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013A, P013B, P013E, P013F, P2270 or P2271 10.0 volts < system voltage< 32.0 volts = Valid = Not Valid = Not Valid = False 1225 <= RPM <= **2200** **1075** <= RPM <= **2275** 3 gps <= Airflow <= 12 gps **40.4** mph <= Veh Speed <= **77.7** mph	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = multiple tests per trip are allowed. Green Sensor Delay Criteria The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Vehicle Speed range to keep test enabled (after initially enabled)	**37.3** mph <= Veh Speed <= **82.0** mph	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	
					Closed loop integral	**0.80** <= 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	>= **180.0** sec		
					Predicted Catalyst temp	**615** ºC <= Cat Temp <= **980** ºC		
					Fuel State	= DFCO possible		
					All of the above met for at least **3.0** seconds, and then the Force Cat Rich intrusive stage is requested.			
O2 Sensor Signal Stuck Rich Bank 1 Sensor 2	P2271	This DTC determines if the post catalyst O2 sensor is stuck in a normal rich voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic is an intrusive test which requests the DFCO mode to achieve the required lean threshold.	Post O2 sensor cannot achieve the lean threshold voltage. AND The Accumulated mass air flow monitored during the Stuck Rich Voltage Test is greater than the threshold before the above voltage threshold is met.	1) Post O2S signal > 100 mvolts AND 2) Accumulated air flow during stuck rich test > **42** grams.	No Active DTC's	TPS_ThrottleAuthority Defaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA	Frequency: Once per trip Note: if NaPOPD_b_Reset FastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_Rapid ResponseActive = TRUE, multiple tests per trip are allowed.	2 trips Type B
					B1S2 Failed this key cycle	P013A, P013B, P013E, P013F or P2270		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria	
					ICAT MAT Burnoff delay	= Not Valid	The diagnostic will not be enabled until the next ignition cycle after	
					Green O2S Condition	= Not Valid		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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 Predicted Catalyst temp Fuel State DTC's Passed DTC's Passed DTC's Passed After above conditions are met: DFCO mode is continued (wo driver initiated pedal input).	= False **1225** <= RPM <= **2200** 3 gps <= Airflow <= 12 gps **40.4** mph <= Veh Speed <= **77.7** mph 0.80 <= C/L Int <= 1.07 = TRUE not in control of purge not in estimate mode = enabled = not active = not active = not active >= **180.0** sec **615** ºC <= Cat Temp <= **980** ºC = DFCO possible = P2270 (and P2272 (if applicable)) = P013E (and P014A (if applicable)) = P013A (and P013C (if applicable))	the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
O2 Sensor Signal Stuck Lean Bank 2 Sensor 2	**P2272**	**This DTC determines if the post catalyst O2 sensor is stuck in a normal lean voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic is an intrusive test (during coast) which increases the delivered fuel to achieve the required rich threshold.**	**Post O2 sensor 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 > 64 grams.**	**No Active DTC's**	**TPS_ThrottleAuthorityDefaulted 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_ResetFastRespFunc= FALSE for the given Fuel Bank OR NaPOPD_b_RapidResponseActive = TRUE, multiple**	**2 trips Type B**

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						EngineMisfireDetected_FA EthanolCompositionSensor_FA	tests per trip are allowed.	
					B2S2 Failed this key cycle	P013C, P013D, P014A, P014B, P2272 or P2273		
					System Voltage	10.0 volts < system voltage< 32.0 volts		
					Learned heater resistance	= Valid	Green Sensor Delay Criteria	
					ICAT MAT Burnoff delay	= Not Valid	The diagnostic will not be enabled until the next ignition cycle after the following has been met: Airflow greater than 22 gps for 120000 grams of accumulated flow non-continuously. (Note that all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only enabled when the vehicle is new and cannot be enabled in service	
					Green O2S Condition	= Not Valid		
					Low Fuel Condition Diag	= False		
					Engine Speed to initially enable test	1225 <= RPM <= 2200		
					Engine Speed range to keep test enabled (after initially enabled)	1075 <= RPM <= 2275		
					Engine Airflow	3 gps <= Airflow <= 12 gps		
					Vehicle Speed to initially enable test	40.4 mph <= Veh Speed <= 77.7 mph		
					Vehicle Speed range to keep test enabled (after initially enabled)	37.3 mph <= Veh Speed <= 82.0 mph		
					Closed loop integral	0.80 <= 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	>= 180.0 sec		
					Predicted Catalyst temp	615 ºC <= Cat Temp <= 980 ºC		
					Fuel State	= DFCO possible		
					All of the above met for at least the Force Cat Rich intrusive stage is requested.	3.0 seconds, and then		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					the Power Out Rich intrusive stage is requested.			
O2 Sensor Signal Stuck Rich Bank 2 Sensor 2	P2273	This DTC determines if the post catalyst O2 sensor is stuck in a normal rich voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic is an intrusive test which requests the DFCO mode to achieve the required lean threshold.	Post O2 sensor cannot achieve the lean threshold voltage. AND The Accumulated mass air flow monitored during the Stuck Rich Voltage Test is greater than the threshold before the above voltage threshold is met.	1) Post O2S signal > 100 mvolts AND 2) Accumulated air flow during stuck rich test > 42 grams.	No Active DTC's B2S2 Failed this key cycle System Voltage Learned heater resistance 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	TPS_ThrottleAuthorityDefaulted ECT_Sensor_FA IAT_SensorFA MAF_SensorFA MAP_SensorFA AIR System FA FuelInjectorCircuit_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA EngineMisfireDetected_FA EthanolCompositionSensor_FA P013C, P013D, P014A, P014B or P2272 10.0 volts < system voltage< 32.0 volts = Valid = Not Valid = Not Valid = False 1225 <= RPM <= 2200 3 gps <= Airflow <= 12 gps 40.4 mph <= Veh Speed <= 77.7 mph 0.80 <= C/L Int <= 1.07 = TRUE not in control of purge not in estimate mode = enabled = not active = not active = not active	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 must be met on the next ignition cycle for the test to run on that ignition cycle). Note: This feature is only	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					O2S Heater on Time **Predicted Catalyst temp** **Fuel State** **DTC's Passed** **DTC's Passed** **DTC's Passed**	**>= 180.0 sec** **615 ºC <= Cat Temp <= 980 ºC** **= DFCO possible** **= P2270 (and P2272 (if applicable))** **= P013E (and P014A (if applicable))** **= P013A (and P013C (if applicable))**	**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).			
SIDI High Pressure Pump	P228C	Detects measured fuel rail pressure bias too low from desired fuel pressure.	Desired Pressure - Measure Pressure	≥ 3.00 Mpa	Battery Voltage Low Pressure Pump Engine Run Time	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	Pressure Error - 750 failures out of 938 samples	1 trips Type A

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

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 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	Pressure Error - 750 failures out of 938 samples	1 trips Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Secondary AIR System Pressure Sensor Circuit Bank 1	**P2430**	**This DTC detects a stuck in range pressure sensor signal when the AIR pump is commanded on.**	**Average Error and Signal Variation**	**< 30.00 kPa** **< 0.00 kPa**	**BARO** **Inlet Air Temp** **Coolant Temp** **Engine off time** **System Voltage**	**> 77 kPa** **> 256.0 deg C.** **> 256.0 deg C.** **< -256.0 deg C.** **> 3600.0 seconds** **> 10.0 OR < 32.0 Volts**	**Stuck in range cumulative time > 30.0 seconds**	**0 trip(s)** **Type X**
				disable conditions:	**MAP** **Engine Speed** **MAF** **No active DTCs:**	**< 20 kPa for 2 seconds** **> 5000 RPM** **> 50 gm/s for 3 seconds** **AIRValveControlCircuit FA** **AIRPumpControlCircuit FA** **AIRSysPressSnsrB1CktLoFA** **AIRSysPressSnsrB1CktHiFA** **ControllerProcessorPerf_FA** **5VoltReferenceA_FA** **5VoltReferenceB_FA**	**Frequency: Once per trip when SAI pump commanded On**	
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	**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.
		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.						
Control Module Communication Bus A Off	U0073	This DTC monitors for a BUS A off condition	Bus off failures	≥ 5 counts	CAN hardware is bus OFF for	≥ 0.0375 seconds	Diagnostic runs in 1000 ms loop	Type B 2 trips
			out of	≥ 5 samples				
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
Lost Communication With Anti-Lock Brake System (ABS) Control Module	**U0121**	**This DTC monitors for a loss of communication with the ABS control module.**	**Message is not received from controller for out of**	**12 counts 12 samples**	**Run/Crank Voltage** **Power mode is RUN** **Communication bus is not OFF or is typed as a C code** **Normal Communication is enabled** **Normal Transmit capability is TRUE** **The diagnostic system is not disabled**	**11 volts ≤ Voltage ≤ 32 volts**	**The diagnostic runs in the 1000 ms loop**	**Type C 1 trips**

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

P0442: EONV Pressure Threshold Table (in Pascals)

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

	0.0000	6.2499	12.4998	18.7497	24.9996	31.2495	37.4994	43.7493	49.9992	56.2491	62.4990	68.7490	74.9989	81.2488	87.4987	93.7486	99.9985
-10.0000	float -2.5	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
-4.3750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
1.2500	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
6.8750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
12.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
18.1250	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
23.7500	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
29.3750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
35.0000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
40.6250	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
46.2500	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
51.8750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
57.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
63.1250	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
68.7500	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
74.3750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
80.0000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000

P0442: Estimate of Ambient Temperature Valid Conditioning Time

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

Axis	Curve
0	200
600	220
1200	250
1800	250
2400	250
3000	220
3600	220
4200	200
4800	200
5400	200
6000	200
6600	200
7200	190
7800	180
8400	180
9000	180
9600	180
10200	170
10800	170
11700	150
12600	150
13500	150
14400	150
15300	140
16200	140
17100	140
18000	140
19200	120
20400	120
21600	120
22800	120
24000	120
25200	120

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

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

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

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

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

Axis	Curve
0	60
6	60
12	60
19	60
25	60
31	60
37	60
44	60
50	60
56	60
62	60
69	60
75	60
81	60
87	60
94	60
100	60

P0461, P2066, P2636: Transfer Pump Enable

TransferPumpOnTimeLimit (in seconds)
Axis is Fuel Level in %

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

P0114: IAT Intermittent Weight Factor

X axis is Filtered Intake Air Temperature in Deg C

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

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

TPS Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.600	0.800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000

MAF Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.600	1.000	1.000	1.000	1.000	1.000	0.700	1.000	0.636	1.000	0.757	0.543	0.587	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	150.0	170.0	180.0	200.0	350.0
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

MAP1 Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.600	0.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000

MAP2 Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.600	0.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000

MAP3 Residual Weight Factor based on RPM

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

TIAP1 Residual Weight Factor based on RPM

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

SCIAP1 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2800	3100	3200	3300	3500	3700	4000	4200	4500	5000	5500	6500	8000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

SCIAP2 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2800	3100	3200	3300	3500	3700	4000	4200	4500	5000	5500	6500	8000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Boost Residual Weight Factor based on % of Boost

% Boost	0.00	0.06	0.13	0.19	0.25	0.31	0.38	0.44	0.50	0.56	0.63	0.69	0.75	0.81	0.88	0.94	1.00
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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

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

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

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

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

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

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

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

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

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

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

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

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

Supercharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)						
TPS Model Failure	MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	SCIAP 1 Model Failure	SCIAP 2 Model Failure	DTC Set
T	T	T	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	F	P1101
F	F	F	F	T	T	F	T	P0121
F	F	F	F	T	T	T	F	P1101
F	F	F	F	T	T	T	T	P0236
F	F	F	T	F	F	F	F	P1101
F	F	F	T	F	F	F	T	P1101
F	F	F	T	F	F	T	F	P1101
F	F	F	T	F	F	T	T	P1101
F	F	F	T	F	T	F	F	P1101
F	F	F	T	F	T	F	T	P1101
F	F	F	T	F	T	T	F	P1101
F	F	F	T	F	T	T	T	P1101
F	F	F	T	T	F	F	F	P1101
F	F	F	T	T	F	F	T	P1101
F	F	F	T	T	F	T	F	P1101
F	F	F	T	T	F	T	T	P1101
F	F	F	T	T	T	F	F	P1101
F	F	F	T	T	T	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	F	T	P1101
F	F	T	F	T	F	T	F	P1101
F	F	T	F	T	F	T	T	P1101
F	F	T	F	T	T	F	F	P1101
F	F	T	F	T	T	F	T	P1101
F	F	T	F	T	T	T	F	P1101
F	F	T	F	T	T	T	T	P1101

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

Turbocharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)								
MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	MAP 3 Model Failure	TIAP 1 Model Failure	TPS Model Failure	TIAP Correlation Failure	TIAP Correlation Valid	DTC Set
F	T	T	F	T	T	F	F	P1101
F	T	T	F	T	T	F	T	P1101
F	T	T	F	T	T	T	F	P1101
F	T	T	F	T	T	T	T	P1101
F	T	T	T	F	F	F	F	P0106
F	T	T	T	F	F	F	T	P0106
F	T	T	T	F	F	T	F	P0106
F	T	T	T	F	F	T	T	P0106
F	T	T	T	F	T	F	F	P1101
F	T	T	T	F	T	F	T	P1101
F	T	T	T	F	T	T	F	P1101
F	T	T	T	F	T	T	T	P1101
F	T	T	T	T	F	F	F	P1101
F	T	T	T	T	F	F	T	P1101
F	T	T	T	T	F	T	F	P1101
F	T	T	T	T	F	T	T	P1101
F	T	T	T	T	T	F	F	P1101
F	T	T	T	T	T	F	T	P1101
F	T	T	T	T	T	T	F	P1101
F	T	T	T	T	T	T	T	P1101
T	F	F	F	F	F	F	F	P1101
T	F	F	F	F	F	F	T	P1101
T	F	F	F	F	F	T	F	P1101
T	F	F	F	F	F	T	T	P0236
T	F	F	F	F	T	F	F	P1101
T	F	F	F	F	T	F	T	P0121
T	F	F	F	F	T	T	F	P1101
T	F	F	F	F	T	T	T	P0236
T	F	F	F	T	F	F	F	P1101
T	F	F	F	T	F	F	T	P1101
T	F	F	F	T	F	T	F	P1101
T	F	F	F	T	F	T	T	P0236
T	F	F	F	T	T	F	F	P1101
T	F	F	F	T	T	F	T	P0121
T	F	F	F	T	T	T	F	P1101
T	F	F	F	T	T	T	T	P0236
T	F	F	T	F	F	F	F	P1101
T	F	F	T	F	F	F	T	P1101
T	F	F	T	F	F	T	F	P1101
T	F	F	T	F	F	T	T	P1101
T	F	F	T	F	T	F	F	P1101
T	F	F	T	F	T	F	T	P1101
T	F	F	T	F	T	T	F	P1101
T	F	F	T	F	T	T	T	P1101
T	F	F	T	T	F	F	F	P1101
T	F	F	T	T	F	F	T	P1101
T	F	F	T	T	F	T	F	P1101
T	F	F	T	T	F	T	T	P1101
T	F	F	T	T	T	F	F	P1101
T	F	F	T	T	T	F	T	P1101
T	F	F	T	T	T	T	F	P1101
T	F	F	T	T	T	T	T	P1101
T	F	T	F	F	F	F	F	P1101
T	F	T	F	F	F	F	T	P1101
T	F	T	F	F	F	T	F	P1101
T	F	T	F	F	F	T	T	P1101
T	F	T	F	F	T	F	F	P1101
T	F	T	F	F	T	F	T	P1101
T	F	T	F	F	T	T	F	P1101
T	F	T	F	F	T	T	T	P1101

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	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
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	F	T	F	P1101
T	T	F	T	F	F	T	T	P1101
T	T	F	T	F	T	F	F	P1101
T	T	F	T	F	T	F	T	P1101
T	T	F	T	F	T	T	F	P1101
T	T	F	T	F	T	T	T	P1101
T	T	F	T	T	F	F	F	P1101
T	T	F	T	T	F	F	T	P1101
T	T	F	T	T	F	T	F	P1101
T	T	F	T	T	F	T	T	P1101
T	T	F	T	T	T	F	F	P1101
T	T	F	T	T	T	F	T	P1101
T	T	F	T	T	T	T	F	P1101
T	T	F	T	T	T	T	T	P1101
T	T	T	F	F	F	F	F	P1101
T	T	T	F	F	F	F	T	P1101
T	T	T	F	F	F	T	F	P1101
T	T	T	F	F	F	T	T	P1101

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	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
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	0.0600	0.0600	0.0600	0.0600
1000	0.0600	0.0600	0.0600	0.0600
1500	0.0600	0.0600	0.0600	0.0600
2000	0.0600	0.0600	0.0600	0.0600
2500	0.0600	0.0600	0.0600	0.0600
3000	0.0700	0.0700	0.0700	0.0700
3500	0.1500	0.1500	0.1500	0.1500
4000	0.2400	0.2400	0.2400	0.2400
4500	0.3400	0.3400	0.3400	0.3400
5000	0.4500	0.4500	0.4500	0.4500
5500	0.5700	0.5700	0.5700	0.5700
6000	0.7000	0.7000	0.7000	0.7000
6500	0.8400	0.8400	0.8400	0.8400
7000	0.8400	0.8400	0.8400	0.8400
7500	0.8400	0.8400	0.8400	0.8400
8000	0.8400	0.8400	0.8400	0.8400
8500	0.8400	0.8400	0.8400	0.8400

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 ar
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 rang

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 Methc

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

Open Circuit Thresholds:

1. 20 kHz Method:

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenCktThrshMin:	2.6870	2.7571	2.8069	2.8369	2.8469	2.8369	2.8069	2.7571	2.6870	2.5969	2.4871	2.3569	2.2070	2.0371	1.8469	1.6370	1.4070

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenCktThrshMax:	8.9492	9.0042	9.0293	9.0242	8.9893	8.9243	8.8291	8.7041	8.5493	8.3643	8.1492	7.9043	7.6292	7.3242	6.9893	6.6243	6.2292

2. Normal Noise Method:

Engine Speed (RPM):	2700	2900	3000	3250	3500	3750	4000	4250	4500	4750	5000	5500	6000	6500	7000	7500	8500
OpenCktThrshMin:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Engine Speed (RPM):	2700	2900	3000	3250	3500	3750	4000	4250	4500	4750	5000	5500	6000	6500	7000	7500	8500
OpenCktThrshMax:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

P06B6/P06B7

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenTestThreshLo	0.0000	0.0000	0.0000	0.0181	0.0200	0.0500	0.0801	0.1201	0.1299	0.1599	0.1799	0.2000	0.2200	0.2600	0.3000	0.3201	0.3401

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenTestThreshHi	0.0291	0.0376	0.0598	0.1799	0.3000	0.3999	0.5100	0.5200	0.5300	0.7500	1.1001	1.3999	1.6001	1.8000	2.0000	2.2000	2.3999

AFIM Section _ Ian MacEwen

KtOXYD_cmp_AFIM_LngthThrsh1

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
110	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
140	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
170	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	3504	3504	3808	3808	4208	4496	50000	50000	50000	50000	50000	50000	50000
230	50000	3216	3616	4224	3648	3648	3504	3504	4736	5040	4928	5088	5088	50000	50000	50000	50000
260	3216	3216	3616	4224	3648	3648	3504	3504	4736	5040	4928	5088	5088	50000	50000	50000	50000
290	3216	3216	3648	4224	3968	4560	4160	4160	5024	5216	5808	5104	5104	50000	50000	50000	50000
320	3328	3328	4144	4416	4432	4560	4848	4192	5232	5440	5312	6304	6304	50000	50000	50000	50000
350	4000	4000	4496	4496	4000	4608	4784	5008	5696	5488	5808	5808	5808	50000	50000	50000	50000
380	4496	4496	4496	5008	5008	5504	5504	5504	6000	6000	6496	6496	6496	50000	50000	50000	50000
410	5008	5008	5008	5008	5008	5008	5504	5504	6496	6496	6496	6496	6496	50000	50000	50000	50000
440	5504	5504	5504	6000	6000	6000	6000	6000	6496	6496	6496	6496	7008	7008	50000	50000	50000
470	5504	5504	5504	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	50000	50000	50000
500	50000	50000	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	50000	50000	50000
530	50000	50000	50000	50000	50000	50000	7008	7008	7008	7008	7008	7008	7008	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh1_DoD **(AFM applications only)**

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
110	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
140	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
170	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
230	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
260	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
290	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
320	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
350	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
380	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
410	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
440	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
470	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
500	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
530	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh2

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
110	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
140	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
170	50000	50000	50000	50000	50000	3008	3008	3008	3008	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	3504	3008	3296	3296	3008	3504	3504	5008	50000	50000	50000	50000	50000
230	3296	3296	3248	3248	3248	3504	3296	3296	3504	3504	3504	5008	5008	50000	50000	50000	50000
260	3296	3296	3248	3248	3248	3504	3296	3296	3504	3504	3504	5008	5008	50000	50000	50000	50000
290	3504	3504	3744	3744	3744	3504	3504	3744	4256	4496	4496	5008	5008	50000	50000	50000	50000
320	4000	4000	4000	4000	4000	3504	3504	4496	5248	6000	5504	5248	5248	50000	50000	50000	50000
350	4000	4000	4000	4000	4096	4496	5008	5008	5008	5504	5504	5504	5504	50000	50000	50000	50000
380	4000	4000	4000	4496	4496	5008	5008	5008	5008	5104	5248	5552	5552	50000	50000	50000	50000
410	4000	4000	4000	4000	4496	4496	5008	5008	5008	5104	5248	6256	6256	50000	50000	50000	50000
440	4000	4000	4000	4496	4496	4496	5008	5504	5504	5504	5504	5504	5504	50000	50000	50000	50000
470	4000	4000	4000	4000	4496	4496	5008	5504	5504	5504	5504	5504	5504	50000	50000	50000	50000
500	50000	50000	4000	4000	4496	4496	5008	6496	6000	6000	6000	6000	6000	50000	50000	50000	50000
530	50000	50000	50000	50000	50000	50000	6496	6496	6000	6000	6000	6000	6000	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh2_DoD (AFM applications only)

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
110	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
140	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
170	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
230	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
260	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
290	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
320	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
350	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
380	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
410	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
440	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
470	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
500	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
530	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_K_AFIM_QualFactor1

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
290	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
320	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
350	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
380	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
410	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
440	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
470	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

KtOXYD_K_AFIM_QualFactor1_DoD (AFM applications only)

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
350	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
380	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
410	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

KtOXYD_K_AFIM_QualFactor2

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
320	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
350	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
380	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
410	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
440	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
470	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

KtOXYD_K_AFIM_QualFactor2_DoD (AFM applications only)

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
350	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
380	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
410	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

Tables supporting Clutch Diagnostics

P0806

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

Axis	**0**	**6.2485**	**12.497**	**18.7455**	**24.994**	**31.2425**	**37.491**	**43.7395**	**49.988**	**56.2365**	**62.485**	**68.7335**	**74.982**	**81.2305**	**87.479**	**93.7275**	**99.976**
Curve	10.0	10.0	10.0	10.0	10.0	25.0	50.0	75.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

P0806

ResidualErrorEnableLow Table **AXIS is Gear**

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

P0806

ResidualErrorEnableHigh Table AXIS is Gear

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

Tables supporting AIR Diagnostics

P0411

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

Axis	0.0	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0
Curve	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0

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	39.0	42.0	45.0	48.0
Curve	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0

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	0.0	0.0	0.0	0.0	0.0	0.0	0.0

P0411

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

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

P0411

Phase 1 System Volt Test Weight Factor axis is system volts

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

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	26.0	28.0	30.0	32.0
Curve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

P2440

Bank 1 Valve Pressure Error axis weighted time in seconds

Axis	0	1	2	3	4	5	6	7	8
Curve	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0

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	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0

P2440

Phase 2 Baro Test Weight Factor axis is Baro in Kpa

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

P2440

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

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

P2440

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

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

P2444

Bank 1 Pump Pressure Error **axis weighted time in seconds**

Axis	0	1	2	3	4	5	6	7	8
Curve	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

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	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

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	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

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_PurgOfAirMode5	CeFADR_e_Cell09_PurgOffAirMode4	CeFADR_e_Cell10_PurgOffAirMode3	CeFADR_e_Cell11_PurgOffAirMode2	CeFADR_e_Cell12_PurgOffAirMode1	CeFADR_e_Cell13_PurgOffAirMode0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
FASD Cell Usage	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_NonSelectedCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_NonSelectedCell
FASD Enabled In Cell?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO

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

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

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

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

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

-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
80	80	80	60	60	40	40	25	25	25	15	15	15	25	30	30	30

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

Non-THMR Only

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

	IAT Range Low	Hi	-40	-28	-16	-4	8	20	32	44	56	68	80
Primary	10.0 ° C	52.0 ° C	10519	10519	10519	10519	10519	9332	8144	6957	5770	4583	3396
Alternate	-7.0 ° C	10.0 ° C	10468	10468	10468	9353	8237	7121	6005	4889	3773	3773	3773

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

THMR Only

Z axis is the accumulated time failure threshold (seconds
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
8	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
61	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
8	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
61	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
8	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
61	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
8	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
61	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	1300	1400	1500	1600
8	1450	1300	1150	1090	900	739	491	400	209	138	95	60	35
9	1350	1200	1050	1008	800	600	431	350	193	120	80	45	30
11	1250	1100	950	900	700	511	403	297	176	112	65	35	22
12	1000	950	900	854	670	489	355	193	158	97	55	30	20
13	1500	1400	1350	1250	743	550	416	197	165	102	58	35	25
15	1700	1650	1625	1550	937	631	432	209	175	115	60	43	35
17	1800	1750	1725	1675	1084	675	450	230	220	180	75	60	50
19	1900	1800	1750	1700	1169	721	483	250	230	200	80	65	55
22	2000	1850	1775	1725	1207	762	600	300	260	250	100	70	60
25	2100	1900	1850	1800	1300	1100	800	325	300	285	120	100	65
29	2200	2000	1950	1900	1400	1200	1000	350	315	300	180	155	75
33	2300	2100	2050	2000	1500	1300	1050	375	325	315	210	200	135
38	2400	2200	2150	2100	1600	1400	1100	400	335	325	240	230	200
42	2500	2300	2250	2150	1700	1500	1200	450	350	330	255	245	210
48	2600	2400	2350	2250	1800	1600	1300	500	360	335	280	270	220
54	2700	2500	2450	2350	1900	1700	1400	600	370	340	300	290	230
61	2800	2600	2550	2450	2000	1800	1600	700	390	360	320	300	250

P0300-P0308: Idle Cyl Mode ddt

load

	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
8	1500	1400	1250	1125	890	745	508	443	226	155	105	71	48
9	1400	1300	1150	1073	799	606	491	323	206	133	85	54	40
11	1300	1200	1100	949	696	534	400	307	189	120	82	45	30
12	1200	1100	1052	865	666	523	363	190	170	107	77	40	25
13	1400	1300	1400	1250	875	600	451	196	178	120	85	60	49
15	1600	1500	1625	1550	1018	735	462	206	197	145	94	80	59
17	1800	1700	1725	1675	1134	841	479	250	230	180	97	90	65
19	2000	1900	1750	1700	1258	925	487	275	240	200	115	95	70
22	2200	2100	1800	1750	1294	950	492	300	265	230	120	100	80
25	2400	2200	1900	1850	1400	1300	506	325	290	260	135	115	90
29	2500	2300	2000	1950	1500	1400	522	350	315	300	210	170	100
33	2600	2400	2100	2050	1600	1500	673	375	325	315	225	215	145
38	2700	2500	2200	2150	1700	1600	782	400	335	325	250	240	210
42	2800	2600	2300	2200	1800	1700	820	450	350	330	265	255	220
48	2900	2700	2400	2300	1900	1800	1050	500	360	335	290	280	230
54	3000	2800	2600	2400	2100	1900	1100	600	375	340	320	300	240
61	3100	2900	2700	2500	2300	2000	1300	700	390	360	340	320	260

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

Load

	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
8	1700	1600	960	715	515	439	291	233	160	108	95	80	64	44	39	31	28	21
9	1600	1500	935	698	498	401	261	209	151	105	70	51	41	37	28	26	26	17
11	1500	1450	900	507	348	308	232	188	147	100	60	46	38	31	25	22	21	15
12	1450	1400	820	620	427	284	219	176	143	95	78	44	37	30	24	19	17	10
13	1550	1559	870	653	485	289	226	197	150	112	86	49	47	33	27	20	19	11
15	1650	1597	907	735	537	300	271	210	163	130	90	58	49	41	31	22	21	14
17	1675	1625	985	785	620	319	301	214	181	136	105	61	50	43	35	25	22	17
19	1700	1641	1070	810	661	400	311	291	199	155	117	81	58	45	39	30	26	21
22	1725	1696	1124	901	690	601	469	311	208	175	133	94	70	50	41	32	30	25
25	1750	1709	1199	1177	865	732	500	325	221	189	140	109	93	58	47	43	31	27
29	1800	1724	1443	1250	938	760	521	397	257	207	160	121	106	85	63	55	46	27
33	1900	1737	1500	1300	1005	850	563	416	275	226	175	150	122	88	73	57	51	36
38	2100	1900	1700	1500	1075	950	741	436	298	238	212	185	140	102	83	64	55	46
42	2300	2100	1900	1700	1200	1050	786	496	310	296	234	213	145	120	91	75	61	50
48	2500	2300	2100	1900	1400	1200	812	569	407	369	291	264	190	133	101	81	70	58
54	2700	2500	2300	2100	1600	1400	1000	625	605	427	323	281	223	161	135	100	90	64
61	2900	2700	2500	2300	1800	1600	1205	826	657	481	361	303	251	194	145	118	99	70

Load

	3500	4000	4500	5000	5500	6000	6500	7000
8	17	14	10	9	7	6	5	4
9	15	11	8	7	6	5	4	3
11	13	9	6	5	5	4	3	2
12	9	8	6	5	4	3	2	2
13	9	10	8	6	5	3	2	2
15	11	11	8	6	5	4	3	2
17	14	12	9	7	6	4	3	3
19	17	13	9	7	7	5	4	3
22	19	15	10	8	7	5	4	4
25	20	17	11	8	6	6	5	4
29	24	19	11	10	7	6	5	5
33	27	21	13	12	9	7	7	6
38	31	22	14	13	10	8	7	7
42	37	26	16	13	12	9	8	7
48	43	28	19	15	12	10	9	9
54	47	30	20	17	14	11	10	10
61	56	41	24	20	17	15	12	10

P0300-P0308: Cyl Mode ddt

load

	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
8	2200	2100	1700	1300	1000	750	425	400	300	200	130	110	82	58	42	38	31	24
9	2100	2000	1550	1150	900	650	360	280	170	120	93	57	48	41	36	35	28	19
11	1900	1800	1400	900	800	500	330	260	160	115	90	55	43	36	31	28	25	16
12	1800	1700	1200	850	685	475	325	250	180	109	85	52	40	35	30	25	20	12
13	1900	1851	1300	900	735	500	350	275	185	130	110	70	55	45	35	31	25	13
15	2000	1900	1360	925	780	530	360	290	200	155	116	83	62	50	40	35	27	16
17	2100	2000	1405	1150	850	600	380	340	220	175	143	95	72	53	43	38	30	20
19	2200	2100	1850	1280	900	620	450	400	290	235	160	100	75	60	47	42	35	24
22	2300	2200	1950	1400	1000	705	575	550	300	265	185	140	95	74	52	50	40	27
25	2400	2300	2000	1750	1300	1120	650	625	425	300	200	155	115	80	71	60	48	28
29	2600	2400	2100	1800	1400	1300	800	645	500	315	240	175	136	100	79	69	52	36
33	2800	2600	2200	1900	1600	1400	1200	650	560	335	265	210	149	101	85	75	55	43
38	3000	2800	2300	2000	1800	1600	1300	1000	600	400	325	262	175	118	90	84	63	50
42	3100	2900	2500	2200	2000	1800	1400	1200	850	500	350	285	200	127	104	95	70	58
48	3200	3000	2600	2400	2200	2000	1600	1500	1200	900	550	350	225	149	130	125	81	65
54	3300	3100	2800	2600	2400	2200	2000	1800	1500	1100	900	600	500	172	175	150	100	69
61	3400	3200	3000	2800	2600	2400	2200	2000	1700	1200	1000	800	600	202	190	160	117	74

load

	3500	4000	4500	5000	5500	6000	6500	7000
8	18	15	10	9	7	6	5	4
9	16	12	8	7	6	5	4	3
11	14	8	6	5	5	4	3	2
12	10	7	6	5	4	3	1	1
13	11	10	8	6	4	3	2	2
15	13	11	9	7	5	4	2	2
17	14	12	10	7	6	4	3	3
19	18	14	10	8	7	5	3	3
22	21	16	11	9	7	5	4	4
25	24	19	14	11	8	7	4	4
29	29	22	14	12	9	8	5	5
33	30	24	15	13	11	8	7	6
38	37	27	21	15	13	9	7	7
42	40	31	22	18	14	10	8	7
48	48	32	25	20	16	11	10	9
54	55	35	28	23	19	12	11	10
61	64	46	31	27	22	15	14	10

P0300-P0308: Rev Mode Table

OR (decel index > Rev Mode Table)

load

	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3500	4000	4500	5000	5500	6000	6500
8	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
61	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

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

OR (decel index > Rev Mode Table)

load

	7000	4000	4500	5000	5500	6000	6500	7000
8	32767	35	30	26	16	32767	32767	32767
9	32767	38	32	25	18	32767	32767	32767
11	32767	40	32	24	22	32767	32767	32767
12	32767	45	32	26	22	32767	32767	32767
13	32767	50	40	28	24	32767	32767	32767
15	32767	55	45	34	26	32767	32767	32767
17	32767	65	55	40	32	32767	32767	32767
19	32767	80	60	45	35	32767	32767	32767
22	32767	90	70	50	40	32767	32767	32767
25	32767	100	80	60	48	32767	32767	32767
29	32767	115	95	70	55	32767	32767	32767
33	32767	130	110	85	65	32767	32767	32767
38	32767	140	125	95	75	32767	32767	32767
42	32767	150	140	110	85	32767	32767	32767
48	32767	180	160	120	100	32767	32767	32767
54	32767	200	180	135	120	32767	32767	32767
61	32767	225	200	150	140	32767	32767	32767

P0300-P0308: AFM Mode Table

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

Load

	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
8	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
61	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

Load

	3500	4000	4500	5000	5500	6000	6500	7000
8	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767
61	32767	32767	32767	32767	32767	32767	32767	32767

P0300-P0308: Zero torque engine load

Zero Torque: All Cylinders active

RPM	Pct load
400	15.85
500	11.85
600	10.25
700	8.50
800	7.95
900	7.60
1000	7.40
1100	7.50
1200	7.50
1400	7.60
1600	7.45
1800	7.55
2000	7.55
2200	7.65
2400	7.70
2600	7.70
2800	7.95
3000	8.15
3500	10.13
4000	12.10
4500	14.08
5000	16.05
5500	18.03
6000	20.00
6500	21.98
7000	23.95

Baro KPa	Multiplier
65	0.83
70	0.86
75	0.88
80	0.91
85	0.93
90	0.96
95	0.98
100	1.00
105	1.02

Zero Torque: Active Fuel Management (AFM)

RPM	Pct load
400	32.00
500	31.00
600	30.00
700	30.00
800	30.00
900	30.00
1000	30.00
1100	30.00
1200	20.00
1400	19.00
1600	18.00
1800	17.00
2000	20.00
2200	20.00
2400	20.00
2600	20.00
2800	20.00
3000	20.00
3500	20.00
4000	20.00
4500	20.00
5000	20.00
5500	20.00
6000	20.00
6500	20.00
7000	20.00

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	5	5	5	5	5	5	5	5
10	5	5	5	5	5	5	5	5
20	5	5	5	5	5	5	5	5
30	5	5	5	5	5	5	5	5
40	5	5	5	5	5	5	5	5
50	5	5	5	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 indicate

	0.000	0.010	0.021	0.032	0.043	0.054	0.065	0.076	0.088	0.099	0.110	0.121	0.132	0.143	0.154	0.165	2.000
0.000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.010	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.021	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.033	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.044	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.056	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.067	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.079	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.090	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.101	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.113	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.124	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.136	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.147	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.159	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.170	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

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

	0.000	0.010	0.021	0.032	0.043	0.054	0.065	0.076	0.088	0.099	0.110	0.121	0.132	0.143	0.154	0.165	2.000
0.000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.010	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.021	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.033	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.044	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.056	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.067	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.079	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.090	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.101	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.113	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.124	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.136	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.147	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.159	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.170	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

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

	0.0	10.0	20.0	50.0	80.0
0.0	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	33	33	33	33	33
25.0	34	34	34	34	34
31.3	35	35	35	35	35
37.5	35	35	35	35	35
43.8	36	36	36	36	36
50.0	36	36	36	36	36
56.3	36	36	36	36	36
62.5	36	36	36	36	36
68.8	36	36	36	36	36
75.0	36	36	36	36	36
81.3	36	36	36	36	36
87.5	36	36	36	36	36
93.8	36	36	36	36	36
100.0	36	36	36	36	36

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	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	33	33	33	33	33
25.0	34	34	34	34	34
31.3	35	35	35	35	35
37.5	35	35	35	35	35
43.8	36	36	36	36	36
50.0	36	36	36	36	36
56.3	36	36	36	36	36
62.5	36	36	36	36	36
68.8	36	36	36	36	36
75.0	36	36	36	36	36
81.3	36	36	36	36	36
87.5	36	36	36	36	36
93.8	36	36	36	36	36
100.0	36	36	36	36	36

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	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	33	33	33	33	33
25.0	34	34	34	34	34
31.3	35	35	35	35	35
37.5	35	35	35	35	35
43.8	36	36	36	36	36
50.0	36	36	36	36	36
56.3	36	36	36	36	36
62.5	36	36	36	36	36
68.8	36	36	36	36	36
75.0	36	36	36	36	36
81.3	36	36	36	36	36
87.5	36	36	36	36	36
93.8	36	36	36	36	36
100.0	36	36	36	36	36

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	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	33	33	33	33	33
25.0	34	34	34	34	34
31.3	35	35	35	35	35
37.5	35	35	35	35	35
43.8	36	36	36	36	36
50.0	36	36	36	36	36
56.3	36	36	36	36	36
62.5	36	36	36	36	36
68.8	36	36	36	36	36
75.0	36	36	36	36	36
81.3	36	36	36	36	36
87.5	36	36	36	36	36
93.8	36	36	36	36	36
100.0	36	36	36	36	36

P0016: Cam Correlation Oil Temperature Threshold

X axis is Engine Oil Temperature in Deg C

Temp	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
	300.0	300.0	7.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

CATD Section Rob Genslak

MinimumEngineRunTime

Coolant Temp	40	50	60	70	80
Engine Run Time	700	100	100	100	100

MinAirflowToWarmCatalyst

Engine Coolant	0	45	90
MinAirFlowToWrmCat	12	8	4

Define Close Loop

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	151	126	101	41	19	19	19	19	19	11	11	11	11	11	11	11	11

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	104.000	116.000	128.000	140.000	152.000
400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000

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	104.000	116.000	128.000	140.000	152.000
400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000

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	104.000	116.000	128.000	140.000	152.000
400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000

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	104.000	116.000	128.000	140.000	152.000
400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000

KtPHSD_t_StablePositionTimeIc1

X axis is Deg C
Y axis is RPM

	-40.0000	-28.0000	-16.0000	-4.0000	8.0000	20.0000	32.0000	44.0000	56.0000	68.0000	80.0000	92.0000	104.0000	116.0000	128.0000	140.0000	152.0000
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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	104.000	116.000	128.000	140.000	152.000
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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	104.000	116.000	128.000	140.000	152.000
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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	104.000	116.000	128.000	140.000	152.000
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Tables supporting Engine Oil Temperature Sensor

P0196

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

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

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

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

Tables supporting Deactivation System Performance

P3400

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

Axis	**1st Gear**	**2nd Gear**	**3rd Gear**	**4th Gear**	**5thGear**	**6th Gear**	**Neutral**	**Reverse**	**Park**
Curve	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
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
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	47.6406	35.4375	32.3281	23.5391	27.7344	27.6094	24.7500	22.4766	255.0000

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

X-axis	5.0003	10.0006	14.9994	19.9997	25.0000	30.0003	35.0006	39.9994	99.9985
Data	15.9688	17.7344	17.9219	24.6328	29.9375	40.2969	52.5625	48.4766	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	#######	#######	#######	#######	#######
Data	20.0000	50.0000	80.0000	115.0000	150.0000	176.0000	194.0000	203.0000	210.0000

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

X-axis	6.0000	7.0000	8.0000	9.0000	10.0000	11.0000	12.0000	13.0000	14.0000
Data	0.0000	20.0000	60.0000	150.0000	250.0000	300.0000	300.0000	300.0000	300.0000

P1682: Ignition Voltage Correleation

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

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

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

X-axis is task loop time

Data is threshold (seconds)

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	0.2000	0.2000	0.2000

X-axis is task loop time

Data is threshold (seconds)

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	0.2000	0.2000	0.2000

X-axis is task loop time

Data indicates if feature is enabled

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	1.0000	1.0000	0.0000

P16F3: No fast unmanaged retarded spark above the applied spark

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

KtSPRK_phi_DeltTorqueScrtyAdv

APC/Erpm	500.00	980.74	1461.48	1942.23	2422.97	2903.71	3384.45	3865.20	4345.94	4826.68	5307.42	5788.16	6268.91	6749.65	7230.39	7711.13	8191.88
80.00	50.03	55.13	52.22	48.97	48.00	44.31	40.11	36.06	32.13	29.97	28.20	27.03	25.86	25.55	25.55	25.55	25.55
160.00	49.59	44.81	37.66	33.19	33.91	30.05	28.95	26.91	24.08	22.84	21.81	20.69	19.58	19.28	19.28	19.28	19.28
240.00	49.19	37.56	28.67	25.06	26.20	22.75	22.70	21.45	19.25	18.47	17.78	16.77	15.75	15.47	15.47	15.47	15.47
320.00	48.77	32.38	23.06	20.11	21.36	18.31	18.67	17.84	16.03	15.41	14.84	14.00	13.16	12.92	12.92	12.92	12.92
400.00	48.36	28.47	19.28	16.80	18.03	15.30	15.86	15.27	13.75	13.20	12.70	11.92	11.14	10.92	10.92	10.92	10.92
480.00	47.97	25.41	16.56	14.41	15.59	13.11	13.78	13.34	12.03	11.55	11.09	10.34	9.59	9.39	9.39	9.39	9.39
560.00	45.08	22.95	14.53	12.63	13.73	11.47	12.19	11.86	10.69	10.27	9.84	9.14	8.42	8.23	8.23	8.23	8.23
640.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
720.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
800.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
880.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
960.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1040.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1120.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1200.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1280.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1360.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84

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	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000

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	#######	#######
350.0000	#######	4096.0000	4096.0000	4096.0000	#######	#######
500.0000	70.0000	70.0000	70.0000	70.0000	60.0000	50.0000
600.0000	40.0000	30.0000	30.0000	30.0000	30.0000	30.0000
800.0000	22.7530	19.8440	17.9445	16.5587	12.1265	10.0957
1000.0000	21.9360	18.7173	16.6155	15.1037	11.4960	11.0470
1200.0000	26.0100	22.1260	19.5895	17.7653	14.7715	14.2020
1400.0000	30.0610	25.5647	22.6285	20.5167	17.7100	17.7100
1600.0000	27.3210	22.8247	19.8885	17.7767	14.9700	14.9700
2100.0000	21.3210	16.8247	13.8885	11.7767	8.9700	8.9700
2600.0000	14.3210	9.8247	6.8885	4.7767	1.9700	1.9700
3100.0000	9.4310	4.9347	1.9985	-0.1133	-2.9200	-2.9200
3600.0000	6.9210	2.4247	-0.5115	-2.6233	-5.4300	-5.4300
4100.0000	4.4010	-0.0953	-3.0315	-5.1433	-7.9500	-7.9500
4600.0000	1.0910	-3.4053	-6.3415	-8.4533	-11.2600	-11.2600
5100.0000	-2.5490	-7.0453	-9.9815	-12.0933	-14.9000	-14.9000
6500.0000	-14.0690	-18.5653	-21.5015	-23.6133	-26.4200	-26.4200

P00C6

KtFHPD_p_HPS_PressFallLoThrsh

Coolant Axis

Eth %	-40	-30	-20	-10	-5	0	8	16	20	24	32	40	48	64	80	90	112
0.0000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12.5000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
25.0000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
37.5000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
50.0000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
62.5000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
75.0000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
87.5000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
100.0000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2

P00C6

KtFHPD_Cnt_HPS_PressFallLoThrsh

Coolant Axis

Eth %	-40	-30	-20	-10	-5	0	8	16	20	24	32	40	48	64	80	90	112
0.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
12.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
25.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
37.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
50.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
62.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
75.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
87.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
100.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

P00C6

KtFHPC_p_HighPressStart

Coolant Axis

Eth %	-40	-30	-20	-10	-5	0	8	16	20	24	32	40	48	64	80	90	112
0.0000	12	10	10	8	6	4	3	3	3	3	3	3	3	3	3	3	3
12.5000	12	10	10	8	6	4	3	3	3	3	3	3	3	3	3	3	3
25.0000	12	10	10	8	5	4	3	3	3	3	3	3	3	3	3	3	3
37.5000	12	10	10	8	7	5	5	5	5	5	5	5	3	3	3	3	3
50.0000	12	10	10	8	8	6	5	5	5	5	5	5	3	3	3	3	3
62.5000	13	13	13	12	12	10	10	10	8	7	6	5	3	3	3	3	3
75.0000	13	13	13	12	12	10	10	10	8	7	6	5	3	3	3	3	3
87.5000	13	13	13	12	12	10	10	10	8	7	6	5	3	3	3	3	3
100.0000	13	13	13	12	12	10	10	10	8	7	6	5	3	3	3	3	3

P00C6

KtFHPC_t_HighPressStartTmout

Coolant Axis

-40	-30	-20	-10	-5	0	8	16	20	24	32	40	48	64	80	90	112
11.0	11.0	10.0	9.0	8.0	7.0	5.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0

P0089

P163A

P228C

P228D

P0191

KtFHPD_t_PumpCntrlEngRunThrsh

-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	30.0

P0191

KtFHPD_t_SnsPrfStuckCrankTmout

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

FASD Section_Ian MacEwen

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	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

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

Long-Term Fuel Trim Cell Usage

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

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	IgnitionOffTimeValid P2610
			GetEPSR_TmSinceEngRunningValid	GetEPSR_TmSinceEngRunningValid	TimeSinceEngineRunningValid 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	P1174 or P219A
			GetDFIR_FaultActive(CeDFIR_e_FuelTrimCylBalB2)	A/F Imbalance Bank2	P1175 or P219B
MacEwen	Secondary Air	AIRR	GetAIRR_b_AIR_PresSensorFault	AIRSystemPressureSensorFA	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)	ClutchPositionSensorCircuit Lo FA	P0807
			GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktHi)	ClutchPositionSensorCircuit Hi 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

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes																			
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																
			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																	

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes
			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

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes											
			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											
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() GetEOTI_b_EngOilModelValid	A/C_FailedOn	P0645											
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	GetMSFR_b_EngMisfDtctd_FA	GetFULR_b_FuelInjCkt_FA	GetFULR_b_FuelInjCkt_TFTKO	GetFADR_b_FuelTrimSysB1_FA	GetFADR_b_FuelTrimSysB2_FA	GetMAFR_b_MAF_SnsrTFTKO	GetMAPR_b_MAP_SnsrTFTKO	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				

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes
					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 GetVLTR_b_V5B_FA	5VoltReferenceA_FA 5VoltReferenceB_FA	P0641 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_Composite()	P2122 P2123
			GetAPSR_PPS_2_OOR_Flt_Composite()	GetAPSR_PPS_2_OOR_Flt_Composite()	P2127 P2128
			GetAPSR_b_PPS_1_OOR_Flt_Cmposite()	GetAPSR_b_PPS_1_OOR_Flt_Cmposite()	P2122 P2123
			GetAPSR_b_PPS_2_OOR_Flt_Cmposite()	GetAPSR_b_PPS_2_OOR_Flt_Cmposite()	P2127 P2128
			GetAPSR_b_PPS_1_OutofRangeFlt()	GetAPSR_b_PPS_1_OutofRangeFlt()	P2122 P2123
			GetAPSR_b_PPS_2_OutofRangeFlt()	GetAPSR_b_PPS_2_OutofRangeFlt()	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_FltComposite()	P0122 P0123
			GetTPSR_b_TPS2_OOR_FltComposite()	GetTPSR_b_TPS2_OOR_FltComposite()	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

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes
			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 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	TransOutputSpeedSensor_Error	
			GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktLo) GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktHi)		
	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.
Engine Coolant Temperature (ECT) Sensor Circuit Intermittent	P0119	Circuit Continuity This DTC detects large step changes in the ECT signal circuit or the ECT sensor. Allowable high and low limits are calculated for the next sample based on the previous sample.	ECT temperature step change: 1) postive step change is greater than high limit OR 2) negitive step change is lower than low limit.		No Active DTC's	P0117 P0118	3 failures out of 4 samples 1 sec/ sample Continuous	2 trips Type B
Fuel Composition Sensor Circuit Low	P0178	Detects Out of Range Low Frequency Signal	Flex Fuel Sensor Output Frequency	< 45 Hertz	Powertrain Relay	> 11.0 Volts < 32.0 Volts	5 failures out of 10 samples 100 ms loop Continuous	2 trip(s) Type B
Fuel Composition Sensor Circuit High	P0179	Detects Out of Range High Frequency Signal	Flex Fuel Sensor Output Frequency	> 155 Hertz <= 185 Hertz	Powertrain Relay	> 11.0 Volts < 32.0 Volts	5 failures out of 10 samples 100 ms loop Continuous	2 trip(s) Type B
Fuel Economy Mode Circuit Low	P159F	This DTC will detect a fuel saver switch input that is too low out of range.	Fuel Saver Switch % of 5V range The normal operating range of the fuel saver mode switch is: Switch depressed % of 5V range: Switch released % of 5V range:	< 29.0 % < 66.8 % ≥ 29.0 % < 88.8 % ≥ 72.8 %			200 failures out of 250 samples 25 ms / sample Continuous	2 trips Type B
Fuel Economy Mode Circuit High	P15A0	This DTC will detect a fuel saver switch input that is too high out of range.	Fuel Saver Switch % of 5V range	≥ 88.8 %			200 failures out of 250 samples	2 trips Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			The normal operating range of the fuel saver mode switch is: Switch depressed % of 5V range: Switch released % of 5V range:	 < 66.8 % ≥ 29.0 % < 88.8 % ≥ 72.8 %			25 ms / sample Continuous	
Fuel Economy Mode Switch Performance	P15A1	This DTC will detect a fuel saver switch input that is in an indeterminant range.	Fuel Saver Switch % of 5V is in an indeterminate range: The normal operating range of the fuel saver mode switch is: Switch depressed % of 5V range: Switch released % of 5V range:	66.8 % ≤ % 5 volts < 72.8 % < 66.8 % ≥ 29.0 % < 88.8 % ≥ 72.8 %			200 failures out of 250 samples 25 ms / sample Continuous	2 trips Type B
Fuel Conductivity Out Of Range (water in fuel)	P2269	Detects Sensor Frequency Signal	Flex Fuel Sensor Output Frequency	> 185 Hertz	Powertrain Relay	> 11.0 Volts < 32.0 Volts	5 failures out of 10 samples 100 ms loop Continuous	2 trip(s) Type B

P0442: EONV Pressure Threshold Table (in Pascals)

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

	0.0000	6.2499	12.4998	18.7497	24.9996	31.2495	37.4994	43.7493	49.9992	56.2491	62.4990	68.7490	74.9989	81.2488	87.4987	93.7486	99.9985
-10.0000	float -2.5	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
-4.3750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
1.2500	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
6.8750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
12.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
18.1250	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
23.7500	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
29.3750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
35.0000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
40.6250	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
46.2500	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
51.8750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
57.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
63.1250	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
68.7500	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
74.3750	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000
80.0000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000	-2.5000

P0442: Estimate of Ambient Temperature Valid Conditioning Time

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

Axis	Curve
0	200
600	220
1200	250
1800	250
2400	250
3000	220
3600	220
4200	200
4800	200
5400	200
6000	200
6600	200
7200	190
7800	180
8400	180
9000	180
9600	180
10200	170
10800	170
11700	150
12600	150
13500	150
14400	150
15300	140
16200	140
17100	140
18000	140
19200	120
20400	120
21600	120
22800	120
24000	120
25200	120

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

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

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

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

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

Axis	Curve
0	60
6	60
12	60
19	60
25	60
31	60
37	60
44	60
50	60
56	60
62	60
69	60
75	60
81	60
87	60
94	60
100	60

P0461, P2066, P2636: Transfer Pump Enable

TransferPumpOnTimeLimit (in seconds)
Axis is Fuel Level in %

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

P0114: IAT Intermittent Weight Factor

X axis is Filtered Intake Air Temperature in Deg C

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

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

TPS Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.600	0.800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000

MAF Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.600	1.000	1.000	1.000	1.000	1.000	0.700	1.000	0.636	1.000	0.757	0.543	0.587	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	150.0	170.0	180.0	200.0	350.0
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

MAP1 Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.600	0.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000

MAP2 Residual Weight Factor based on RPM

RPM	0	250	750	1250	1750	2250	2750	3250	3750	4250	4750	5250	5750	6250	6750	7250	9000
	0.000	0.600	0.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000

MAP3 Residual Weight Factor based on RPM

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

TIAP1 Residual Weight Factor based on RPM

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

SCIAP1 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2800	3100	3200	3300	3500	3700	4000	4200	4500	5000	5500	6500	8000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

SCIAP2 Residual Weight Factor based on RPM

RPM	0	1500	2200	2500	2800	3100	3200	3300	3500	3700	4000	4200	4500	5000	5500	6500	8000
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Boost Residual Weight Factor based on % of Boost

% Boost	0.00	0.06	0.13	0.19	0.25	0.31	0.38	0.44	0.50	0.56	0.63	0.69	0.75	0.81	0.88	0.94	1.00
	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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

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

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

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

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

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

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

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

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

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

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

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

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

Supercharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)						
TPS Model Failure	MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	SCIAP 1 Model Failure	SCIAP 2 Model Failure	DTC Set
T	T	T	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	F	P1101
F	F	F	F	T	T	F	T	P0121
F	F	F	F	T	T	T	F	P1101
F	F	F	F	T	T	T	T	P0236
F	F	F	T	F	F	F	F	P1101
F	F	F	T	F	F	F	T	P1101
F	F	F	T	F	F	T	F	P1101
F	F	F	T	F	F	T	T	P1101
F	F	F	T	F	T	F	F	P1101
F	F	F	T	F	T	F	T	P1101
F	F	F	T	F	T	T	F	P1101
F	F	F	T	F	T	T	T	P1101
F	F	F	T	T	F	F	F	P1101
F	F	F	T	T	F	F	T	P1101
F	F	F	T	T	F	T	F	P1101
F	F	F	T	T	F	T	T	P1101
F	F	F	T	T	T	F	F	P1101
F	F	F	T	T	T	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	F	T	P1101
F	F	T	F	T	F	T	F	P1101
F	F	T	F	T	F	T	T	P1101
F	F	T	F	T	T	F	F	P1101
F	F	T	F	T	T	F	T	P1101
F	F	T	F	T	T	T	F	P1101
F	F	T	F	T	T	T	T	P1101

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

Turbocharger Intake Flow Rationality Diagnostic Failure Matrix (Con't)								
MAF Model Failure	MAP 1 Model Failure	MAP 2 Model Failure	MAP 3 Model Failure	TIAP 1 Model Failure	TPS Model Failure	TIAP Correlation Failure	TIAP Correlation Valid	DTC Set
F	T	T	F	T	T	F	F	P1101
F	T	T	F	T	T	F	T	P1101
F	T	T	F	T	T	T	F	P1101
F	T	T	F	T	T	T	T	P1101
F	T	T	T	F	F	F	F	P0106
F	T	T	T	F	F	F	T	P0106
F	T	T	T	F	F	T	F	P0106
F	T	T	T	F	F	T	T	P0106
F	T	T	T	F	T	F	F	P1101
F	T	T	T	F	T	F	T	P1101
F	T	T	T	F	T	T	F	P1101
F	T	T	T	F	T	T	T	P1101
F	T	T	T	T	F	F	F	P1101
F	T	T	T	T	F	F	T	P1101
F	T	T	T	T	F	T	F	P1101
F	T	T	T	T	F	T	T	P1101
F	T	T	T	T	T	F	F	P1101
F	T	T	T	T	T	F	T	P1101
F	T	T	T	T	T	T	F	P1101
F	T	T	T	T	T	T	T	P1101
T	F	F	F	F	F	F	F	P1101
T	F	F	F	F	F	F	T	P1101
T	F	F	F	F	F	T	F	P1101
T	F	F	F	F	F	T	T	P0236
T	F	F	F	F	T	F	F	P1101
T	F	F	F	F	T	F	T	P0121
T	F	F	F	F	T	T	F	P1101
T	F	F	F	F	T	T	T	P0236
T	F	F	F	T	F	F	F	P1101
T	F	F	F	T	F	F	T	P1101
T	F	F	F	T	F	T	F	P1101
T	F	F	F	T	F	T	T	P0236
T	F	F	F	T	T	F	F	P1101
T	F	F	F	T	T	F	T	P0121
T	F	F	F	T	T	T	F	P1101
T	F	F	F	T	T	T	T	P0236
T	F	F	T	F	F	F	F	P1101
T	F	F	T	F	F	F	T	P1101
T	F	F	T	F	F	T	F	P1101
T	F	F	T	F	F	T	T	P1101
T	F	F	T	F	T	F	F	P1101
T	F	F	T	F	T	F	T	P1101
T	F	F	T	F	T	T	F	P1101
T	F	F	T	F	T	T	T	P1101
T	F	F	T	T	F	F	F	P1101
T	F	F	T	T	F	F	T	P1101
T	F	F	T	T	F	T	F	P1101
T	F	F	T	T	F	T	T	P1101
T	F	F	T	T	T	F	F	P1101
T	F	F	T	T	T	F	T	P1101
T	F	F	T	T	T	T	F	P1101
T	F	F	T	T	T	T	T	P1101
T	F	T	F	F	F	F	F	P1101
T	F	T	F	F	F	F	T	P1101
T	F	T	F	F	F	T	F	P1101
T	F	T	F	F	F	T	T	P1101
T	F	T	F	F	T	F	F	P1101
T	F	T	F	F	T	F	T	P1101
T	F	T	F	F	T	T	F	P1101
T	F	T	F	F	T	T	T	P1101

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	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
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	F	T	F	P1101
T	T	F	T	F	F	T	T	P1101
T	T	F	T	F	T	F	F	P1101
T	T	F	T	F	T	F	T	P1101
T	T	F	T	F	T	T	F	P1101
T	T	F	T	F	T	T	T	P1101
T	T	F	T	T	F	F	F	P1101
T	T	F	T	T	F	F	T	P1101
T	T	F	T	T	F	T	F	P1101
T	T	F	T	T	F	T	T	P1101
T	T	F	T	T	T	F	F	P1101
T	T	F	T	T	T	F	T	P1101
T	T	F	T	T	T	T	F	P1101
T	T	F	T	T	T	T	T	P1101
T	T	T	F	F	F	F	F	P1101
T	T	T	F	F	F	F	T	P1101
T	T	T	F	F	F	T	F	P1101
T	T	T	F	F	F	T	T	P1101

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	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
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	0.0600	0.0600	0.0600	0.0600
1000	0.0600	0.0600	0.0600	0.0600
1500	0.0600	0.0600	0.0600	0.0600
2000	0.0600	0.0600	0.0600	0.0600
2500	0.0600	0.0600	0.0600	0.0600
3000	0.0700	0.0700	0.0700	0.0700
3500	0.1500	0.1500	0.1500	0.1500
4000	0.2400	0.2400	0.2400	0.2400
4500	0.3400	0.3400	0.3400	0.3400
5000	0.4500	0.4500	0.4500	0.4500
5500	0.5700	0.5700	0.5700	0.5700
6000	0.7000	0.7000	0.7000	0.7000
6500	0.8400	0.8400	0.8400	0.8400
7000	0.8400	0.8400	0.8400	0.8400
7500	0.8400	0.8400	0.8400	0.8400
8000	0.8400	0.8400	0.8400	0.8400
8500	0.8400	0.8400	0.8400	0.8400

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 ar
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 rang

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 Methc

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

Open Circuit Thresholds:

1. 20 kHz Method:

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenCktThrshMin:	2.6870	2.7571	2.8069	2.8369	2.8469	2.8369	2.8069	2.7571	2.6870	2.5969	2.4871	2.3569	2.2070	2.0371	1.8469	1.6370	1.4070

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenCktThrshMax:	8.9492	9.0042	9.0293	9.0242	8.9893	8.9243	8.8291	8.7041	8.5493	8.3643	8.1492	7.9043	7.6292	7.3242	6.9893	6.6243	6.2292

2. Normal Noise Method:

Engine Speed (RPM):	2700	2900	3000	3250	3500	3750	4000	4250	4500	4750	5000	5500	6000	6500	7000	7500	8500
OpenCktThrshMin:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Engine Speed (RPM):	2700	2900	3000	3250	3500	3750	4000	4250	4500	4750	5000	5500	6000	6500	7000	7500	8500
OpenCktThrshMax:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

P06B6/P06B7

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenTestThreshLo	0.0000	0.0000	0.0000	0.0181	0.0200	0.0500	0.0801	0.1201	0.1299	0.1599	0.1799	0.2000	0.2200	0.2600	0.3000	0.3201	0.3401

Engine Speed (RPM):	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
OpenTestThreshHi	0.0291	0.0376	0.0598	0.1799	0.3000	0.3999	0.5100	0.5200	0.5300	0.7500	1.1001	1.3999	1.6001	1.8000	2.0000	2.2000	2.3999

AFIM Section _ Ian MacEwen

KtOXYD_cmp_AFIM_LngthThrsh1

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
110	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
140	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
170	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	3504	3504	3808	3808	4208	4496	50000	50000	50000	50000	50000	50000	50000
230	50000	3216	3616	4224	3648	3648	3504	3504	4736	5040	4928	5088	5088	50000	50000	50000	50000
260	3216	3216	3616	4224	3648	3648	3504	3504	4736	5040	4928	5088	5088	50000	50000	50000	50000
290	3216	3216	3648	4224	3968	4560	4160	4160	5024	5216	5808	5104	5104	50000	50000	50000	50000
320	3328	3328	4144	4416	4432	4560	4848	4192	5232	5440	5312	6304	6304	50000	50000	50000	50000
350	4000	4000	4496	4496	4000	4608	4784	5008	5696	5488	5808	5808	5808	50000	50000	50000	50000
380	4496	4496	4496	5008	5008	5504	5504	5504	6000	6000	6496	6496	6496	50000	50000	50000	50000
410	5008	5008	5008	5008	5008	5008	5504	5504	6496	6496	6496	6496	6496	50000	50000	50000	50000
440	5504	5504	5504	6000	6000	6000	6000	6000	6496	6496	6496	6496	7008	7008	50000	50000	50000
470	5504	5504	5504	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	50000	50000	50000
500	50000	50000	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	7008	50000	50000	50000
530	50000	50000	50000	50000	50000	50000	7008	7008	7008	7008	7008	7008	7008	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh1_DoD **(AFM applications only)**

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
110	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
140	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
170	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
230	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
260	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
290	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
320	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
350	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
380	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
410	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
440	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
470	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
500	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
530	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh2

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
110	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
140	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
170	50000	50000	50000	50000	50000	3008	3008	3008	3008	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	3504	3008	3296	3296	3008	3504	3504	5008	50000	50000	50000	50000	50000
230	3296	3296	3248	3248	3248	3504	3296	3296	3504	3504	3504	5008	5008	50000	50000	50000	50000
260	3296	3296	3248	3248	3248	3504	3296	3296	3504	3504	3504	5008	5008	50000	50000	50000	50000
290	3504	3504	3744	3744	3744	3504	3504	3744	4256	4496	4496	5008	5008	50000	50000	50000	50000
320	4000	4000	4000	4000	4000	3504	3504	4496	5248	6000	5504	5248	5248	50000	50000	50000	50000
350	4000	4000	4000	4000	4096	4496	5008	5008	5008	5504	5504	5504	5504	50000	50000	50000	50000
380	4000	4000	4000	4496	4496	5008	5008	5008	5008	5104	5248	5552	5552	50000	50000	50000	50000
410	4000	4000	4000	4000	4496	4496	5008	5008	5008	5104	5248	6256	6256	50000	50000	50000	50000
440	4000	4000	4000	4496	4496	4496	5008	5504	5504	5504	5504	5504	5504	50000	50000	50000	50000
470	4000	4000	4000	4000	4496	4496	5008	5504	5504	5504	5504	5504	5504	50000	50000	50000	50000
500	50000	50000	4000	4000	4496	4496	5008	6496	6000	6000	6000	6000	6000	50000	50000	50000	50000
530	50000	50000	50000	50000	50000	50000	6496	6496	6000	6000	6000	6000	6000	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_cmp_AFIM_LngthThrsh2_DoD (AFM applications only)

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
110	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
140	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
170	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
200	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
230	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
260	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
290	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
320	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
350	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
380	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
410	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
440	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
470	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
500	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
530	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
560	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000

KtOXYD_K_AFIM_QualFactor1

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
290	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
320	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
350	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
380	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
410	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
440	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
470	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

KtOXYD_K_AFIM_QualFactor1_DoD (AFM applications only)

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
350	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
380	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
410	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

KtOXYD_K_AFIM_QualFactor2

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
320	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
350	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
380	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
410	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
440	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
470	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

KtOXYD_K_AFIM_QualFactor2_DoD (AFM applications only)

AvgFlow / AvgRPM	800	950	1100	1250	1400	1550	1700	1850	2000	2150	2300	2450	2600	2750	2900	3050	3200
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
350	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
380	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
410	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
440	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
560	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

Tables supporting Clutch Diagnostics

P0806

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

Axis	**0**	**6.2485**	**12.497**	**18.7455**	**24.994**	**31.2425**	**37.491**	**43.7395**	**49.988**	**56.2365**	**62.485**	**68.7335**	**74.982**	**81.2305**	**87.479**	**93.7275**	**99.976**
Curve	10.0	10.0	10.0	10.0	10.0	25.0	50.0	75.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

P0806

ResidualErrorEnableLow Table **AXIS is Gear**

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

P0806

ResidualErrorEnableHigh Table AXIS is Gear

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

Tables supporting AIR Diagnostics

P0411

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

Axis	0.0	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0
Curve	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0

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	39.0	42.0	45.0	48.0
Curve	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0

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	0.0	0.0	0.0	0.0	0.0	0.0	0.0

P0411

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

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

P0411

Phase 1 System Volt Test Weight Factor axis is system volts

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

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	26.0	28.0	30.0	32.0
Curve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

P2440

Bank 1 Valve Pressure Error axis weighted time in seconds

Axis	0	1	2	3	4	5	6	7	8
Curve	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0

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	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0

P2440

Phase 2 Baro Test Weight Factor axis is Baro in Kpa

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

P2440

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

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

P2440

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

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

P2444

Bank 1 Pump Pressure Error **axis weighted time in seconds**

Axis	0	1	2	3	4	5	6	7	8
Curve	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

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	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

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	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

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_PurgOfAirMode5	CeFADR_e_Cell09_PurgOffAirMode4	CeFADR_e_Cell10_PurgOffAirMode3	CeFADR_e_Cell11_PurgOffAirMode2	CeFADR_e_Cell12_PurgOffAirMode1	CeFADR_e_Cell13_PurgOffAirMode0	CeFADR_e_Cell14_PurgOffIdle	CeFADR_e_Cell15_PurgOffDecel
FASD Cell Usage	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_SelectedPurgeCell	CeFADD_e_NonSelectedCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_SelectedNonPurgeCell	CeFADD_e_NonSelectedCell
FASD Enabled In Cell?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO

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

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

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

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

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

-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
80	80	80	60	60	40	40	25	25	25	15	15	15	25	30	30	30

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

Non-THMR Only

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

	IAT Range Low	Hi	-40	-28	-16	-4	8	20	32	44	56	68	80
Primary	10.0 ° C	52.0 ° C	10519	10519	10519	10519	10519	9332	8144	6957	5770	4583	3396
Alternate	-7.0 ° C	10.0 ° C	10468	10468	10468	9353	8237	7121	6005	4889	3773	3773	3773

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

THMR Only

Z axis is the accumulated time failure threshold (seconds
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
8	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
61	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
8	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
61	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
8	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
61	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
8	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
61	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	1300	1400	1500	1600
8	1450	1300	1150	1090	900	739	491	400	209	138	95	60	35
9	1350	1200	1050	1008	800	600	431	350	193	120	80	45	30
11	1250	1100	950	900	700	511	403	297	176	112	65	35	22
12	1000	950	900	854	670	489	355	193	158	97	55	30	20
13	1500	1400	1350	1250	743	550	416	197	165	102	58	35	25
15	1700	1650	1625	1550	937	631	432	209	175	115	60	43	35
17	1800	1750	1725	1675	1084	675	450	230	220	180	75	60	50
19	1900	1800	1750	1700	1169	721	483	250	230	200	80	65	55
22	2000	1850	1775	1725	1207	762	600	300	260	250	100	70	60
25	2100	1900	1850	1800	1300	1100	800	325	300	285	120	100	65
29	2200	2000	1950	1900	1400	1200	1000	350	315	300	180	155	75
33	2300	2100	2050	2000	1500	1300	1050	375	325	315	210	200	135
38	2400	2200	2150	2100	1600	1400	1100	400	335	325	240	230	200
42	2500	2300	2250	2150	1700	1500	1200	450	350	330	255	245	210
48	2600	2400	2350	2250	1800	1600	1300	500	360	335	280	270	220
54	2700	2500	2450	2350	1900	1700	1400	600	370	340	300	290	230
61	2800	2600	2550	2450	2000	1800	1600	700	390	360	320	300	250

P0300-P0308: Idle Cyl Mode ddt

load

	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
8	1500	1400	1250	1125	890	745	508	443	226	155	105	71	48
9	1400	1300	1150	1073	799	606	491	323	206	133	85	54	40
11	1300	1200	1100	949	696	534	400	307	189	120	82	45	30
12	1200	1100	1052	865	666	523	363	190	170	107	77	40	25
13	1400	1300	1400	1250	875	600	451	196	178	120	85	60	49
15	1600	1500	1625	1550	1018	735	462	206	197	145	94	80	59
17	1800	1700	1725	1675	1134	841	479	250	230	180	97	90	65
19	2000	1900	1750	1700	1258	925	487	275	240	200	115	95	70
22	2200	2100	1800	1750	1294	950	492	300	265	230	120	100	80
25	2400	2200	1900	1850	1400	1300	506	325	290	260	135	115	90
29	2500	2300	2000	1950	1500	1400	522	350	315	300	210	170	100
33	2600	2400	2100	2050	1600	1500	673	375	325	315	225	215	145
38	2700	2500	2200	2150	1700	1600	782	400	335	325	250	240	210
42	2800	2600	2300	2200	1800	1700	820	450	350	330	265	255	220
48	2900	2700	2400	2300	1900	1800	1050	500	360	335	290	280	230
54	3000	2800	2600	2400	2100	1900	1100	600	375	340	320	300	240
61	3100	2900	2700	2500	2300	2000	1300	700	390	360	340	320	260

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

Load

	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
8	1700	1600	960	715	515	439	291	233	160	108	95	80	64	44	39	31	28	21
9	1600	1500	935	698	498	401	261	209	151	105	70	51	41	37	28	26	26	17
11	1500	1450	900	507	348	308	232	188	147	100	60	46	38	31	25	22	21	15
12	1450	1400	820	620	427	284	219	176	143	95	78	44	37	30	24	19	17	10
13	1550	1559	870	653	485	289	226	197	150	112	86	49	47	33	27	20	19	11
15	1650	1597	907	735	537	300	271	210	163	130	90	58	49	41	31	22	21	14
17	1675	1625	985	785	620	319	301	214	181	136	105	61	50	43	35	25	22	17
19	1700	1641	1070	810	661	400	311	291	199	155	117	81	58	45	39	30	26	21
22	1725	1696	1124	901	690	601	469	311	208	175	133	94	70	50	41	32	30	25
25	1750	1709	1199	1177	865	732	500	325	221	189	140	109	93	58	47	43	31	27
29	1800	1724	1443	1250	938	760	521	397	257	207	160	121	106	85	63	55	46	27
33	1900	1737	1500	1300	1005	850	563	416	275	226	175	150	122	88	73	57	51	36
38	2100	1900	1700	1500	1075	950	741	436	298	238	212	185	140	102	83	64	55	46
42	2300	2100	1900	1700	1200	1050	786	496	310	296	234	213	145	120	91	75	61	50
48	2500	2300	2100	1900	1400	1200	812	569	407	369	291	264	190	133	101	81	70	58
54	2700	2500	2300	2100	1600	1400	1000	625	605	427	323	281	223	161	135	100	90	64
61	2900	2700	2500	2300	1800	1600	1205	826	657	481	361	303	251	194	145	118	99	70

Load

	3500	4000	4500	5000	5500	6000	6500	7000
8	17	14	10	9	7	6	5	4
9	15	11	8	7	6	5	4	3
11	13	9	6	5	5	4	3	2
12	9	8	6	5	4	3	2	2
13	9	10	8	6	5	3	2	2
15	11	11	8	6	5	4	3	2
17	14	12	9	7	6	4	3	3
19	17	13	9	7	7	5	4	3
22	19	15	10	8	7	5	4	4
25	20	17	11	8	6	6	5	4
29	24	19	11	10	7	6	5	5
33	27	21	13	12	9	7	7	6
38	31	22	14	13	10	8	7	7
42	37	26	16	13	12	9	8	7
48	43	28	19	15	12	10	9	9
54	47	30	20	17	14	11	10	10
61	56	41	24	20	17	15	12	10

P0300-P0308: Cyl Mode ddt

load

	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
8	2200	2100	1700	1300	1000	750	425	400	300	200	130	110	82	58	42	38	31	24
9	2100	2000	1550	1150	900	650	360	280	170	120	93	57	48	41	36	35	28	19
11	1900	1800	1400	900	800	500	330	260	160	115	90	55	43	36	31	28	25	16
12	1800	1700	1200	850	685	475	325	250	180	109	85	52	40	35	30	25	20	12
13	1900	1851	1300	900	735	500	350	275	185	130	110	70	55	45	35	31	25	13
15	2000	1900	1360	925	780	530	360	290	200	155	116	83	62	50	40	35	27	16
17	2100	2000	1405	1150	850	600	380	340	220	175	143	95	72	53	43	38	30	20
19	2200	2100	1850	1280	900	620	450	400	290	235	160	100	75	60	47	42	35	24
22	2300	2200	1950	1400	1000	705	575	550	300	265	185	140	95	74	52	50	40	27
25	2400	2300	2000	1750	1300	1120	650	625	425	300	200	155	115	80	71	60	48	28
29	2600	2400	2100	1800	1400	1300	800	645	500	315	240	175	136	100	79	69	52	36
33	2800	2600	2200	1900	1600	1400	1200	650	560	335	265	210	149	101	85	75	55	43
38	3000	2800	2300	2000	1800	1600	1300	1000	600	400	325	262	175	118	90	84	63	50
42	3100	2900	2500	2200	2000	1800	1400	1200	850	500	350	285	200	127	104	95	70	58
48	3200	3000	2600	2400	2200	2000	1600	1500	1200	900	550	350	225	149	130	125	81	65
54	3300	3100	2800	2600	2400	2200	2000	1800	1500	1100	900	600	500	172	175	150	100	69
61	3400	3200	3000	2800	2600	2400	2200	2000	1700	1200	1000	800	600	202	190	160	117	74

load

	3500	4000	4500	5000	5500	6000	6500	7000
8	18	15	10	9	7	6	5	4
9	16	12	8	7	6	5	4	3
11	14	8	6	5	5	4	3	2
12	10	7	6	5	4	3	1	1
13	11	10	8	6	4	3	2	2
15	13	11	9	7	5	4	2	2
17	14	12	10	7	6	4	3	3
19	18	14	10	8	7	5	3	3
22	21	16	11	9	7	5	4	4
25	24	19	14	11	8	7	4	4
29	29	22	14	12	9	8	5	5
33	30	24	15	13	11	8	7	6
38	37	27	21	15	13	9	7	7
42	40	31	22	18	14	10	8	7
48	48	32	25	20	16	11	10	9
54	55	35	28	23	19	12	11	10
61	64	46	31	27	22	15	14	10

P0300-P0308: Rev Mode Table

OR (decel index > Rev Mode Table)

load

	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3500	4000	4500	5000	5500	6000	6500
8	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
61	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

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

OR (decel index > Rev Mode Table)

load

	7000	4000	4500	5000	5500	6000	6500	7000
8	32767	35	30	26	16	32767	32767	32767
9	32767	38	32	25	18	32767	32767	32767
11	32767	40	32	24	22	32767	32767	32767
12	32767	45	32	26	22	32767	32767	32767
13	32767	50	40	28	24	32767	32767	32767
15	32767	55	45	34	26	32767	32767	32767
17	32767	65	55	40	32	32767	32767	32767
19	32767	80	60	45	35	32767	32767	32767
22	32767	90	70	50	40	32767	32767	32767
25	32767	100	80	60	48	32767	32767	32767
29	32767	115	95	70	55	32767	32767	32767
33	32767	130	110	85	65	32767	32767	32767
38	32767	140	125	95	75	32767	32767	32767
42	32767	150	140	110	85	32767	32767	32767
48	32767	180	160	120	100	32767	32767	32767
54	32767	200	180	135	120	32767	32767	32767
61	32767	225	200	150	140	32767	32767	32767

P0300-P0308: AFM Mode Table

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

Load

	400	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
8	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767
61	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767	32767

Load

	3500	4000	4500	5000	5500	6000	6500	7000
8	32767	32767	32767	32767	32767	32767	32767	32767
9	32767	32767	32767	32767	32767	32767	32767	32767
11	32767	32767	32767	32767	32767	32767	32767	32767
12	32767	32767	32767	32767	32767	32767	32767	32767
13	32767	32767	32767	32767	32767	32767	32767	32767
15	32767	32767	32767	32767	32767	32767	32767	32767
17	32767	32767	32767	32767	32767	32767	32767	32767
19	32767	32767	32767	32767	32767	32767	32767	32767
22	32767	32767	32767	32767	32767	32767	32767	32767
25	32767	32767	32767	32767	32767	32767	32767	32767
29	32767	32767	32767	32767	32767	32767	32767	32767
33	32767	32767	32767	32767	32767	32767	32767	32767
38	32767	32767	32767	32767	32767	32767	32767	32767
42	32767	32767	32767	32767	32767	32767	32767	32767
48	32767	32767	32767	32767	32767	32767	32767	32767
54	32767	32767	32767	32767	32767	32767	32767	32767
61	32767	32767	32767	32767	32767	32767	32767	32767

P0300-P0308: Zero torque engine load

Zero Torque: All Cylinders active

RPM	Pct load
400	15.85
500	11.85
600	10.25
700	8.50
800	7.95
900	7.60
1000	7.40
1100	7.50
1200	7.50
1400	7.60
1600	7.45
1800	7.55
2000	7.55
2200	7.65
2400	7.70
2600	7.70
2800	7.95
3000	8.15
3500	10.13
4000	12.10
4500	14.08
5000	16.05
5500	18.03
6000	20.00
6500	21.98
7000	23.95

Baro KPa	Multiplier
65	0.83
70	0.86
75	0.88
80	0.91
85	0.93
90	0.96
95	0.98
100	1.00
105	1.02

Zero Torque: Active Fuel Management (AFM)

RPM	Pct load
400	32.00
500	31.00
600	30.00
700	30.00
800	30.00
900	30.00
1000	30.00
1100	30.00
1200	20.00
1400	19.00
1600	18.00
1800	17.00
2000	20.00
2200	20.00
2400	20.00
2600	20.00
2800	20.00
3000	20.00
3500	20.00
4000	20.00
4500	20.00
5000	20.00
5500	20.00
6000	20.00
6500	20.00
7000	20.00

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	5	5	5	5	5	5	5	5
10	5	5	5	5	5	5	5	5
20	5	5	5	5	5	5	5	5
30	5	5	5	5	5	5	5	5
40	5	5	5	5	5	5	5	5
50	5	5	5	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 indicate

	0.000	0.010	0.021	0.032	0.043	0.054	0.065	0.076	0.088	0.099	0.110	0.121	0.132	0.143	0.154	0.165	2.000
0.000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.010	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.021	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.033	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.044	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.056	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.067	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.079	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.090	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.101	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.113	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.124	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.136	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.147	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.159	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.170	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

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

	0.000	0.010	0.021	0.032	0.043	0.054	0.065	0.076	0.088	0.099	0.110	0.121	0.132	0.143	0.154	0.165	2.000
0.000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.010	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.021	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.033	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.044	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.056	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.067	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.079	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.090	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.101	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.113	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.124	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.136	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.147	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.159	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0.170	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

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

	0.0	10.0	20.0	50.0	80.0
0.0	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	33	33	33	33	33
25.0	34	34	34	34	34
31.3	35	35	35	35	35
37.5	35	35	35	35	35
43.8	36	36	36	36	36
50.0	36	36	36	36	36
56.3	36	36	36	36	36
62.5	36	36	36	36	36
68.8	36	36	36	36	36
75.0	36	36	36	36	36
81.3	36	36	36	36	36
87.5	36	36	36	36	36
93.8	36	36	36	36	36
100.0	36	36	36	36	36

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	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	33	33	33	33	33
25.0	34	34	34	34	34
31.3	35	35	35	35	35
37.5	35	35	35	35	35
43.8	36	36	36	36	36
50.0	36	36	36	36	36
56.3	36	36	36	36	36
62.5	36	36	36	36	36
68.8	36	36	36	36	36
75.0	36	36	36	36	36
81.3	36	36	36	36	36
87.5	36	36	36	36	36
93.8	36	36	36	36	36
100.0	36	36	36	36	36

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	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	33	33	33	33	33
25.0	34	34	34	34	34
31.3	35	35	35	35	35
37.5	35	35	35	35	35
43.8	36	36	36	36	36
50.0	36	36	36	36	36
56.3	36	36	36	36	36
62.5	36	36	36	36	36
68.8	36	36	36	36	36
75.0	36	36	36	36	36
81.3	36	36	36	36	36
87.5	36	36	36	36	36
93.8	36	36	36	36	36
100.0	36	36	36	36	36

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	32	32	32	32	32
6.3	32	32	32	32	32
12.5	32	32	32	32	32
18.8	33	33	33	33	33
25.0	34	34	34	34	34
31.3	35	35	35	35	35
37.5	35	35	35	35	35
43.8	36	36	36	36	36
50.0	36	36	36	36	36
56.3	36	36	36	36	36
62.5	36	36	36	36	36
68.8	36	36	36	36	36
75.0	36	36	36	36	36
81.3	36	36	36	36	36
87.5	36	36	36	36	36
93.8	36	36	36	36	36
100.0	36	36	36	36	36

P0016: Cam Correlation Oil Temperature Threshold

X axis is Engine Oil Temperature in Deg C

Temp	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
	300.0	300.0	7.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

CATD Section Rob Genslak

MinimumEngineRunTime

Coolant Temp	40	50	60	70	80
Engine Run Time	700	100	100	100	100

MinAirflowToWarmCatalyst

Engine Coolant	0	45	90
MinAirFlowToWrmCat	12	8	4

Define Close Loop

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	151	126	101	41	19	19	19	19	19	11	11	11	11	11	11	11	11

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	104.000	116.000	128.000	140.000	152.000
400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000

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	104.000	116.000	128.000	140.000	152.000
400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000

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	104.000	116.000	128.000	140.000	152.000
400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000

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	104.000	116.000	128.000	140.000	152.000
400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
1600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
2800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
3600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
4800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5200	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
5600	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6400	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
6800	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000

KtPHSD_t_StablePositionTimeIc1

X axis is Deg C
Y axis is RPM

	-40.0000	-28.0000	-16.0000	-4.0000	8.0000	20.0000	32.0000	44.0000	56.0000	68.0000	80.0000	92.0000	104.0000	116.0000	128.0000	140.0000	152.0000
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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	104.000	116.000	128.000	140.000	152.000
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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	104.000	116.000	128.000	140.000	152.000
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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	104.000	116.000	128.000	140.000	152.000
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5200	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5600	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6400	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6800	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Tables supporting Engine Oil Temperature Sensor

P0196

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

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

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

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

Tables supporting Deactivation System Performance

P3400

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

Axis	**1st Gear**	**2nd Gear**	**3rd Gear**	**4th Gear**	**5thGear**	**6th Gear**	**Neutral**	**Reverse**	**Park**
Curve	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
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
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	47.6406	35.4375	32.3281	23.5391	27.7344	27.6094	24.7500	22.4766	255.0000

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

X-axis	5.0003	10.0006	14.9994	19.9997	25.0000	30.0003	35.0006	39.9994	99.9985
Data	15.9688	17.7344	17.9219	24.6328	29.9375	40.2969	52.5625	48.4766	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	#######	#######	#######	#######	#######
Data	20.0000	50.0000	80.0000	115.0000	150.0000	176.0000	194.0000	203.0000	210.0000

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

X-axis	6.0000	7.0000	8.0000	9.0000	10.0000	11.0000	12.0000	13.0000	14.0000
Data	0.0000	20.0000	60.0000	150.0000	250.0000	300.0000	300.0000	300.0000	300.0000

P1682: Ignition Voltage Correleation

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

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

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

X-axis is task loop time

Data is threshold (seconds)

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	0.2000	0.2000	0.2000

X-axis is task loop time

Data is threshold (seconds)

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	0.2000	0.2000	0.2000

X-axis is task loop time

Data indicates if feature is enabled

	CePISR_e_6p25msSeq	CePISR_e_12P5msSeq	CePISR_e_25msSeq
X-axis			
Data	1.0000	1.0000	0.0000

P16F3: No fast unmanaged retarded spark above the applied spark

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

KtSPRK_phi_DeltTorqueScrtyAdv

APC/Erpm	500.00	980.74	1461.48	1942.23	2422.97	2903.71	3384.45	3865.20	4345.94	4826.68	5307.42	5788.16	6268.91	6749.65	7230.39	7711.13	8191.88
80.00	50.03	55.13	52.22	48.97	48.00	44.31	40.11	36.06	32.13	29.97	28.20	27.03	25.86	25.55	25.55	25.55	25.55
160.00	49.59	44.81	37.66	33.19	33.91	30.05	28.95	26.91	24.08	22.84	21.81	20.69	19.58	19.28	19.28	19.28	19.28
240.00	49.19	37.56	28.67	25.06	26.20	22.75	22.70	21.45	19.25	18.47	17.78	16.77	15.75	15.47	15.47	15.47	15.47
320.00	48.77	32.38	23.06	20.11	21.36	18.31	18.67	17.84	16.03	15.41	14.84	14.00	13.16	12.92	12.92	12.92	12.92
400.00	48.36	28.47	19.28	16.80	18.03	15.30	15.86	15.27	13.75	13.20	12.70	11.92	11.14	10.92	10.92	10.92	10.92
480.00	47.97	25.41	16.56	14.41	15.59	13.11	13.78	13.34	12.03	11.55	11.09	10.34	9.59	9.39	9.39	9.39	9.39
560.00	45.08	22.95	14.53	12.63	13.73	11.47	12.19	11.86	10.69	10.27	9.84	9.14	8.42	8.23	8.23	8.23	8.23
640.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
720.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
800.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
880.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
960.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1040.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1120.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1200.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1280.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84
1360.00	43.61	22.08	13.83	12.02	13.09	10.92	11.64	11.34	10.22	9.81	9.42	8.72	8.03	7.84	7.84	7.84	7.84

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	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000

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	#######	#######
350.0000	#######	4096.0000	4096.0000	4096.0000	#######	#######
500.0000	70.0000	70.0000	70.0000	70.0000	60.0000	50.0000
600.0000	40.0000	30.0000	30.0000	30.0000	30.0000	30.0000
800.0000	22.7530	19.8440	17.9445	16.5587	12.1265	10.0957
1000.0000	21.9360	18.7173	16.6155	15.1037	11.4960	11.0470
1200.0000	26.0100	22.1260	19.5895	17.7653	14.7715	14.2020
1400.0000	30.0610	25.5647	22.6285	20.5167	17.7100	17.7100
1600.0000	27.3210	22.8247	19.8885	17.7767	14.9700	14.9700
2100.0000	21.3210	16.8247	13.8885	11.7767	8.9700	8.9700
2600.0000	14.3210	9.8247	6.8885	4.7767	1.9700	1.9700
3100.0000	9.4310	4.9347	1.9985	-0.1133	-2.9200	-2.9200
3600.0000	6.9210	2.4247	-0.5115	-2.6233	-5.4300	-5.4300
4100.0000	4.4010	-0.0953	-3.0315	-5.1433	-7.9500	-7.9500
4600.0000	1.0910	-3.4053	-6.3415	-8.4533	-11.2600	-11.2600
5100.0000	-2.5490	-7.0453	-9.9815	-12.0933	-14.9000	-14.9000
6500.0000	-14.0690	-18.5653	-21.5015	-23.6133	-26.4200	-26.4200

P00C6 KtFHPD_p_HPS_PressFallLoThrsh

Coolant Axis

Eth %	-40	-30	-20	-10	-5	0	8	16	20	24	32	40	48	64	80	90	112
0.0000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12.5000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
25.0000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
37.5000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
50.0000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
62.5000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
75.0000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
87.5000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2
100.0000	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2

P00C6 KtFHPD_Cnt_HPS_PressFallLoThrsh

Coolant Axis

Eth %	-40	-30	-20	-10	-5	0	8	16	20	24	32	40	48	64	80	90	112
0.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
12.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
25.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
37.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
50.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
62.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
75.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
87.5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
100.0000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

P00C6 KtFHPC_p_HighPressStart

Coolant Axis

Eth %	-40	-30	-20	-10	-5	0	8	16	20	24	32	40	48	64	80	90	112
0.0000	12	10	10	8	6	4	3	3	3	3	3	3	3	3	3	3	3
12.5000	12	10	10	8	6	4	3	3	3	3	3	3	3	3	3	3	3
25.0000	12	10	10	8	5	4	3	3	3	3	3	3	3	3	3	3	3
37.5000	12	10	10	8	7	5	5	5	5	5	5	5	3	3	3	3	3
50.0000	12	10	10	8	8	6	5	5	5	5	5	5	3	3	3	3	3
62.5000	13	13	13	12	12	10	10	10	8	7	6	5	3	3	3	3	3
75.0000	13	13	13	12	12	10	10	10	8	7	6	5	3	3	3	3	3
87.5000	13	13	13	12	12	10	10	10	8	7	6	5	3	3	3	3	3
100.0000	13	13	13	12	12	10	10	10	8	7	6	5	3	3	3	3	3

P00C6 KtFHPC_t_HighPressStartTmout

Coolant Axis

-40	-30	-20	-10	-5	0	8	16	20	24	32	40	48	64	80	90	112
11.0	11.0	10.0	9.0	8.0	7.0	5.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0

P0089
P163A
P228C
P228D
P0191 KtFHPD_t_PumpCntrlEngRunThrsh

-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	30.0

P0191 KtFHPD_t_SnsPrfStuckCrankTmout

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

FASD Section_Ian MacEwen

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	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

KtFSTA_t_ClosedLoopTime

Start-Up Coolant	-40	-28	-16	-4	8	20	32	44	56	68	80	92	104	116	128	140	152
Close Loop Enable Time	151.0	126.0	101.0	41.0	19.0	19.0	19.0	19.0	19.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

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

Long-Term Fuel Trim Cell Usage

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

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	IgnitionOffTimeValid P2610
			GetEPSR_TmSinceEngRunningValid	GetEPSR_TmSinceEngRunningValid	TimeSinceEngineRunningValid 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	P1174 or P219A
			GetDFIR_FaultActive(CeDFIR_e_FuelTrimCylBalB2)	A/F Imbalance Bank2	P1175 or P219B
MacEwen	Secondary Air	AIRR	GetAIRR_b_AIR_PresSensorFault	AIRSystemPressureSensorFA	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)	ClutchPositionSensorCircuit Lo FA	P0807
			GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktHi)	ClutchPositionSensorCircuit Hi 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

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes																			
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																
			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																	

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes
			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

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes										
			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										
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() GetEOTI_b_EngOilModelValid	A/C_FailedOn	P0645										
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	GetMSFR_b_EngMisfDtctd_FA	GetFULR_b_FuelInjCkt_FA	GetFULR_b_FuelInjCkt_TFTKO	GetFADR_b_FuelTrimSysB1_FA	GetFADR_b_FuelTrimSysB2_FA	GetMAFR_b_MAF_SnsrTFTKO	GetMAPR_b_MAP_SnsrTFTKO	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			

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes
					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 GetVLTR_b_V5B_FA	5VoltReferenceA_FA 5VoltReferenceB_FA	P0641 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_Composite()	P2122 P2123
			GetAPSR_PPS_2_OOR_Flt_Composite()	GetAPSR_PPS_2_OOR_Flt_Composite()	P2127 P2128
			GetAPSR_b_PPS_1_OOR_Flt_Cmposite()	GetAPSR_b_PPS_1_OOR_Flt_Cmposite()	P2122 P2123
			GetAPSR_b_PPS_2_OOR_Flt_Cmposite()	GetAPSR_b_PPS_2_OOR_Flt_Cmposite()	P2127 P2128
			GetAPSR_b_PPS_1_OutofRangeFlt()	GetAPSR_b_PPS_1_OutofRangeFlt()	P2122 P2123
			GetAPSR_b_PPS_2_OutofRangeFlt()	GetAPSR_b_PPS_2_OutofRangeFlt()	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_FltComposite()	P0122 P0123
			GetTPSR_b_TPS2_OOR_FltComposite()	GetTPSR_b_TPS2_OOR_FltComposite()	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

TS	PDT	Ring	Fault Bundles Produced	Cert Doc Bundle Name	Pcodes
			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 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	TransOutputSpeedSensor_Error	
			GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktLo) GetDFIR_FaultActive(CeDFIR_e_ClchPstnSnsrCktHi)		
	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	C0035:06	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
Left Front Wheel Speed Sensor Circuit Range/ Performance	C0035:18/5A/0F	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
		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	Special Type C
		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	Special Type C
		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	Special Type C
Right Front Wheel Speed Sensor Circuit	C0040:06	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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Right Front Wheel Speed Sensor Circuit Range/ Performance	C0040:18/5A/0F	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
		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	Special Type C
		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	Special Type C
		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	Special Type C
Left Rear Wheel Speed Sensor Circuit	C0045:06	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
Left Rear Wheel Speed Sensor Circuit Range/ Performance	C0045:18/5A/0F	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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		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	Special Type C
		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	Special Type C
		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	Special Type C
Right Rear Wheel Speed Sensor Circuit	C0050:06	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
Right Rear Wheel Speed Sensor Circuit Range/ Performance	C0050:18/5A/0F	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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		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	Special Type C
		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	Special Type C
		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	Special Type C
RAM Fault	C056D:00	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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
ROM Fault	C056D:00	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
		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)	Special Type C
EEPROM Fault	C056D:00	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
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)	Special Type C

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		b) The watchdog monitoring function within the PCU is checked once after power on. The Mcu generates intentional errors in the watchdog word and timing. A failure is set if the PCU fails to recognize this intentional error. EBD/ABS/TCS and AYC are all disable	Calculated watchdog word	≠ sent watchdog word	NA	always enabled	one loop (10 ms)	Special Type C
Loop Time Failure	C056D:00	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
Module Undervoltage	C0800:03	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
Module Overvoltage	C0800:07	Module supply voltage high	Supply voltage to the module in V	18.0 v +/- 1.0V	NA	always enabled	10ms	Special Type C

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel Rail Pressure (FRP) Sensor Performance (rationality)	P018B	This DTC detects a fuel pressure sensor response stuck within the normal operating range	Absolute value of change in fuel pressure as sensed during intrusive test.	<= 30 kPa	1. FRP Circuit Low DTC (P018C) 2. FRP Circuit High DTC (P018D) 3. FuelPump Circuit Low DTC (P0231) 4. FuelPump Circuit High DTC (P0232) 5. FuelPump Circuit Open DTC (P023F) 6. Reference Voltage DTC (P0641) 7. Fuel Pump Control Module Driver Over-temperature DTC's (P064A, P1255) 8. Control Module Internal Performance DTC (P0606) 9. Engine run time 10. Emissions fuel level (PPEI $3FB) AND Engine Run Time	not active not active not active not active not active not active not active >=5 seconds not low > 30 sec	<u>Frequency:</u> Continuous; 12.5 ms loop. 60 seconds between intrusive tests that pass Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec period); otherwise report pass Duration of intrusive test is fueling related (5 to 12 seconds). Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	DTC Type A 1 trip

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					11. Fuel pump control 12. Fuel pump control state 13. Engine fuel flow 14. ECM fuel control system failure (PPEI $1ED)	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
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current AND Fuel Pump Duty Cycle	<=0.5A > 20%	Ignition OR HS Comm OR Fuel Pump Control AND Ignition Run/Crank voltage	Run or Crank Enabled Enabled 9V <voltage< 32V	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel System Control Module Enable Control Circuit	P025A	This DTC detects if there is a fault in the fuel pump control enable circuit	PPEI (PPEI (Powertrain Platform Electrical Interface) Fuel System Request ($1ED)	≠ Fuel Pump Control Module Enable Control Circuit	Ignition AND PPEI Fuel System Request ($1ED)	Run or Crank Valid	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if any software or calibration check sum is incorrect	Calculated Checksum (CRC16)	≠ stored checksum for any of the parts (boot, software, application calibration, system calibration)	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background	DTC Type A 1 trip
Control Module Not Programmed	P0602	Indicates that the FSCM needs to be programmed	This DTC is set via calibration, when KeMEMD_b_NoStartCal	TRUE	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	Runs once at power up	DTC Type A 1 trip
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up	≠ checksum at power-down	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	1 failure Frequency: Once at power-up	DTC Type A 1 trip
Control Module Random Access Memory (RAM)	P0604	Indicates that control module is unable to correctly write and read data to and from RAM	Data read	≠ Data written	Ignition OR HS Comm OR	Run or Crank enabled	1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background.	DTC Type A 1 trip

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Fuel Pump Control	enabled		
Control Module Internal Performance 1. Main Processor Configuration Register Test	P0606	This DTC indicates the FSCM has detected an internal processor fault or external watchdog fault (PID 2032 can tell what causes the fault.)	1. For all I/O configuration register faults: •Register contents	Incorrect value.	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	Tests 1 and 2 1 failure Frequency: Continuously (12.5ms)	DTC Type A 1 trip
2. Processor clock test			2. For Processor Clock Fault: •EE latch flag in EEPROM. OR • RAM latch flag.	0x5A5A 0x5A	1. For all I/O configuration register faults: •KeMEMD_b_ProcFltCfgRegEnbl 2. For Processor Clock Fault: •KeMEMD_b_ProcFltCLKDiagEnbl	TRUE TRUE	Test 3 3 failures out of 15 samples 1 sample/12.5 ms	
3. External watchdog test			3. For External Watchdog Fault: • Software control of fuel pump driver	Control Lost	3. For External Watchdog Fault: •KeFRPD_b_FPExtWDogDiagEnbl 3. For External Watchdog Fault: •Control Module ROM(P0601) 3. For External Watchdog Fault: •Control Module RAM(P0604)	TRUE not active not active		
Control Module Long Term Memory (EEPROM) Performance	P062F	Indicates that the NVM Error flag has not been cleared	Last EEPROM write	Did not complete	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	1 test failure Once on controller power-up	DTC Type A 1 trip
5Volt Reference Circuit (Short High/Low/Out of Range)	P0641	Detects continuous short or out of range on the #1 5V sensor reference circuit	Reference voltage AND Output	>= 0.5V inactive .	Ignition	Run or Crank	15 failures out of 20 samples 1 sample/12.5 ms	DTC Type A 1 trip

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			OR Reference voltage AND Output OR Reference voltage AND Output	>= 5.5V active <= 4.5V active				
			OR Reference voltage □	> 102.5% nominal (i.e., 5.125V) OR <97.5% nominal (i.e., 4.875V)				
Fuel Pump Control Module - Driver Over-temperature 1	P064A	This DTC detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions (Tier 1 supplier Continental responsibility)	Module Range of Operation **AND** Fuel pump driver Temp	1. Module is within Acceptable Operation Range (Motorola's responsibility - FSCM is in normal operating range for module voltage versus PWM duty cycle. Linear range from 100% @ 12.5V to 70% @ 18V.) > 190C	Ignition OR HS Comm OR Fuel Pump Control AND Ignition Run / Crank KeFRPD_b_FPOverTempDiagEnbl	Run or Crank Enabled Enabled 9V<voltage<32V TRUE	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
Fuel Pump Control Module - Driver Over-temperature 2	P1255	This DTC detects if an internal fuel pump driver overtemperature condition exists under extreme operating conditions (GM's responsibility)	Module Range of Operation **AND** Fuel pump driver Temp	Outside normal range (FSCM is NOT in normal operating range for module voltage versus PWM duty cycle. Linear range from 100% @ 12.5V to 70% @ 18V.) > 190C	Ignition OR HS Comm OR Fuel Pump Control AND Ignition Run / Crank KeFRPD_b_FPOverTempDiagEnbl	Run or Crank Enabled Enabled 9V<voltage<32V TRUE	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
Ignition 1 Switch Circuit Low Voltage	P2534	This DTC detects if the Ignition1 Switch circuit is shorted to low or open	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Fuel Pump Flow Performance (rationality)	P2635	This DTC detects degradation in the performance of the SIDI electronic return-less fuel system	Filtered fuel rail pressure error	<= Low Threshold (function of desired fuel rail pressure and fuel flow rate. 15% of resultant Target Pressure) OR >= High Threshold (function of desired fuel rail pressure and fuel flow rate. 15% of resultant Target Pressure)	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		
					9. Control Module Internal Performance DTC (P0606)	not active		
					10. An ECM fuel control system failure (PPEI $1ED)	has not occurred		
					11. The Barometric pressure (PPEI $4C1) signal	valid (for absolute fuel pressure sensor)		
					12. Engine run time	>= 30 seconds		
					13. Emissions fuel level (PPEI $3FB) AND Engine Run Time	not low > 30 sec		
					14. Fuel pump control	enabled		
					15. Fuel pump control state	normal		
					16. Battery Voltage	11V<=voltage=<32V		

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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