SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Heater Control Circuit Bank 1 Sensor 1	P0030	This DTC detects when the circuit is shorted to ground. -- Circuit check	Circuit fault indicated	9 V < System Voltage < 18 V Engine Speed > 425 RPM	100 fails out of 120 samples	Type B
HO2S Heater Control Circuit Bank 1 Sensor 2	P0036	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	9 V < System Voltage < 18 V Engine Speed > 425 RPM	100 fails out of 120 samples	Type B
Mass Air Flow Sensor System Performance	P0101	rationality	Actual MAF - Predicted MAF > interpolated allowable delta (refer to Supporting Data section for information regarding allowable delta map values)	No MAP DTC's failing No TP sensor DTC's failing No other MAF sensor DTC's failing Ignition voltage ≥ 11, ≤ 18 volts TP sensor ≤ 47.9%. TP Delta < 2.9% Purge < 89.9% EGR < 89.9% Engine Vacuum < 58.5 kPa 100 ms MAP delta ≤ 3.8 kPa Mass Air flow ≤ 50 if ignition voltage ≤ 11.5 volts P0401 status = inactive Traction control status = inactive Fuel control status = closed loop Enable criteria stabilized for 10 seconds	25 fails in 50 tests frequency: 100 ms cont.	Type B
Mass Air Flow Sensor Circuit Low Voltage	P0102	range check - min	MAF sensor frequency ≤ 1135 Hz	Engine run state = running Ignition voltage ≥ 10.5 volts Engine speed > 400 rpm Engine run time > 8 seconds Enable criteria stabilized for 2.5 seconds	20 fails in 100 tests frequency: ref. interrupt cont.	Type B
Mass Air Flow Sensor Circuit High Voltage	P0103	range check - max	MAF sensor frequency ≥ 11000 Hz	Engine run state = running Ignition voltage ≥ 10.5 volts Engine speed > 400rpm Engine run time > 8 seconds Enable criteria stabilized for 2.5 seconds	20 fails in 100 tests frequency: ref. interrupt cont.	Type B
Manifold Air Pressure Sensor System Performance	P0106	rationality	Predicted minimum MAP < or predicted maximum MAP > interpolated allowable value based on throttle position and engine speed. (refer to Supporting Data section for information regarding allowable delta map values)	No TP sensor DTC's failing Engine Speed ≥ 1000 rpm but <4000 rpm IAC Delta < 15 cnts. Engine Speed variation ≤ 125 rpm TP sensor variation ≤ 4 %. EGR delta < 10 g/sec TCC state = unchanged for 3 seconds Vehicle brake switch = off for 3 seconds A/C clutch state = unchanged for 2 seconds Traction control state = inactive Engine overtemp protection state = inactive	10 fails in 20 tests frequency: 50 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Manifold Air Pressure Sensor Circuit Low Voltage	P0107	range check - min	Raw MAP ≤ 1.5% of 5 volt reference	No TP sensor DTC's failing Engine run time ≥ 0 seconds Engine Speed > 1000 rpm TP sensor ≥ 9.9 %. or Engine Speed ≤ 1000 TP sensor ≥ 0 %.	20 fails in 40 tests frequency: 50 ms cont.	Type B
Manifold Air Pressure Sensor Circuit High Voltage	P0108	range check - max	Raw MAP ≥ 97.5% of 5 volt reference	No TP sensor DTC's failing Engine run time ≥ 0 seconds Engine Speed > 1000 rpm TP sensor ≤ 97.5 %. or Engine Speed ≤1000 TP sensor < 89.9 %.	20 fails in 40 tests frequency: 50 ms cont.	Type B
Intake Air Temp. Sensor Circuit Low Voltage	P0112	range check - min	Raw IAT ≤ 1.5% of 5 volt reference	No ECT Sensor DTC's failing No VSS DTC's failing ECT ≤ 100 °C Vehicle speed ≥ 15.5 kph Engine run time ≥10 seconds	20 fails in 40 tests frequency: 250 ms cont.	Type B
Intake Air Temp. Sensor Circuit High Voltage	P0113	range check - max	Raw IAT ≥ 95.9% of 5 volt reference	No ECT Sensor DTC's failing No VSS DTC's failing ECT ≥ 0 °C Vehicle speed < 80 kph Engine speed ≥ 50 rpm for 5 seconds Engine run time ≥10 seconds	20 fails in 40 tests frequency: 250 ms cont.	Type B
Coolant Temp Sensor Circuit Low Voltage	P0117	range check - min	Raw ECT ≤ 1.49% of 5 volt reference	No IAT DTC's failing IAT ≤ 70 °C or Engine run time ≥ 10 sec.	3 fails in 5 tests frequency: 1 sec. cont.	Type B
Coolant Temp Sensor Circuit High Voltage	P0118	range check - max	Raw ECT > 97.9% of 5 volt reference	No IAT DTC's failing IAT ≥ -7 °C or Engine run time ≥ 60 sec.	3 fails in 5 tests frequency: 1 sec. cont.	Type B
Throttle Position Sensor Performance	P0121	rationality	Predicted minimum TP < or predicted maximum TP > interpolated allowable value based on MAP and engine speed. (refer to Supporting Data section for information regarding allowable delta map values)	No MAP DTC's failing No IAC DTC's failing No other TP sensor DTC's failing ECT ≥ 0° C MAP ≥ 63.5 kPa for low test or ≤ for high test MAP delta <9.5 kPa Engine run time >30 seconds IAC > 10 but < 160 cnts. Traction control status = not active Injector status = all enabled Engine Over-temp protection status = not active	25 fails in 50 tests frequency: 100 ms cont.	Type B
Throttle Position Sensor Circuit Low Voltage	P0122	range check - min.	Raw TP sensor ≤ 3.1% of 5 volt reference	None	20 fails in 40 tests frequency: 100 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Throttle Position Sensor Circuit High Voltage	P0123	range check - max.	Raw TP sensor ≥ 95.1% of 5 volt reference	Engine Speed ≤ 3000 rpm	20 fails in 40 tests frequency: 100 ms cont.	Type B
Coolant Temp Sensor Excessive Time to Closed Loop Fuel Control	P0125	rationality	Time to reach/maintain ECT ≥ 68 °C > desired time	No IAT DTC's failing No other ECT DTC's failing Engine run state = running Time @ closed throttle < the value determined by startup coolant and minimum IAT. Total airflow < the value determined by startup coolant and minimum IAT. IAT > -40 °C but ≤ 40.2°C ECT > -40 °C Vehicle speed ≥ 1.6 kph	3 sec. frequency: 1 sec. cont.	Type B
HO2S Closed Loop Rationality Bank 1 Sensor 1	P0130	This DTC determines if the O2 sensor voltage is not meeting the voltage criteria to enable closed loop fueling.	Closed loop fuel control O2 sensor Ready flag set to "Not Ready." O2 sensor voltage must be > 500 millivolts or < 350 millivolts to set closed loop fuel O2 Ready flag. Once set to "Ready," the O2 sensor voltage cannot be > 350 millivolts and < 500 millivolts for > 120 seconds or the O2 Ready flag will be reset to "Not Ready." Both Bank 1 Sensor 1 and Bank 2 Sensor 1 O2 sensor Ready flags must be set to Ready to enable closed loop fueling.	No injector DTC's No MAF DTC's No TP sensor DTC's No MAP DTC's No ECT sensor DTC's No Bank 1 Sensor 1 or Bank 2 Sensor 1 DTC's Engine Run Time > 120 sec. Coolant temp > 75 C Predicted O2 Heater Temp > 600 C 9 volts < Ignition Voltage < 18 volts Traction control not active. Catalyst Protection mode not active. 500 ≤ RPM ≤ 5000 3.0 gps ≤ MAF ≤ 30.0 gps Decel Fuel Cut Off not active. Power Enrichment not active. Above conditions must be met for 5.0 seconds.	160 test failures in a 200 test sample. 100 millisecond execution rate. Continuous	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit Low Voltage (bank 1 sensor 1)	P0131	This DTC determines if the O2 sensor or circuit is shorted to low by checking for a lean condition during steady throttle and power enrichment (PE).	O2 sensor voltage < 75 millivolts or O2 sensor voltage < 575 millivolts in PE mode	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled No injectors are disabled 9 volts < Ignition Voltage < 18 volts Air/Fuel ratio ≥ 14.5 but ≤ 14.8 Throttle position ≥ 3 % but ≤ 25 % Above conditions must be met for 3.0 seconds. PE Test: No injectors are disabled PE mode active Above conditions must be met for 2.0 seconds.	475 test failures in a 500 test sample for 2 sets of samples 76 failures in a 80 test sample for PE mode. 100 millisecond execution rate. Continuous	Type B
HO2S Circuit High Voltage (bank 1 sensor 1)	P0132	This DTC determines if the O2 sensor or circuit is shorted to high by checking for a rich condition during steady throttle and decel fuel cut off (DFCO)	O2 sensor voltage > 900 millivolts or O2 sensor voltage > 200 millivolts in DFCO mode	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Air/Fuel ratio ≥ 14.40 but ≤ 14.90 Throttle position ≥ 3 % but ≤ 25 % Above conditions must be met for 3.0 seconds. DFCO Test: DFCO mode must be met for 3.0 seconds. Time not in PE with Air/Fuel ratio ≤ 13.0 must exceed time in PE with Air/Fuel ≤ 13.0	475 test failures in a 500 test sample for 2 sets of samples. 110 failures in a 120 test sample for DFCO mode 100 millisecond execution rate. Continuous	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit Slow Response (bank 1 sensor 1)	P0133	This DTC determines if the O2 sensor functioning properly by checking its response time.	O2 sensor average transition time: L/R > 200.0 msec R/L > 200.0 msec O2 voltage between 325 mv and 625 mv.	No misfire DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No AIR DTC's No Bank 1 Sensor 1 Voltage DTC's DTC P0135 (O2 Heater) not set DTC P1133 (Too Few Switches) not set EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Engine Run Time > 202 sec. Coolant temp > 75 C 1200 < RPM < 2800 15.0 gps < MAF < 35.0 gps Throttle position ≥ 3 % Transmission not in Park, Reverse or Neutral Above conditions met for 3.0 seconds.	90.00 seconds Once per key cycle	Type B
HO2S Circuit Insufficient Activity (bank 1 sensor 1)	P0134	This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open.	O2 sensor > 400 millivolts but < 500 millivolts	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active 9 volts < Ignition Voltage < 18 volts Engine run time > 200 seconds Minimum of 4 occurrences of a delta TP sensor > 5 % during diagnostic test.	570 test failures in a 600 test sample 100 millisecond execution rate. Continuous	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Heater Circuit (bank 1 sensor 1)	P0135	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	The heater current is < 0.040 amps or > 0.800 amps.	Heater driver DTC P0030, P1031, P1032 not set Delta ignition voltage during current measurement < 1 volt Engine Run Time > 300 seconds ECT > 75 °C 1000 < RPM < 2800 10 gps < MAF < 35 gps O2 heater overtemp control not active. Above conditions must be met for 3.0 seconds.	Average of 10 current samples compared to thresholds for each test. 5 tests per key cycle, 120 second delay between tests. 1 second execution rate.	Type B
HO2S Circuit Low Voltage (bank 1 sensor 2)	P0137	This DTC determines if the O2 sensor or circuit is shorted to low by checking for a lean condition during steady throttle and power enrichment (PE).	O2 sensor voltage < 9 millivolts or O2 sensor voltage < 577 millivolts in PE mode	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled No injectors are disabled 9 volts < Ignition Voltage < 18 volts Air/Fuel ratio ≥ 14.4 but ≤ 14.9 Throttle position ≥ 3 % but ≤ 25 % Above conditions must be met for 5.0 seconds. PE Test: No injectors are disabled PE mode active Above conditions must be met for 2.0 seconds.	560 test failures in a 600 test sample for 2 sets of samples 76 failures in a 80 test sample for PE mode. 100 millisecond execution rate. Continuous	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit High Voltage (bank 1 sensor 2)	P0138	This DTC determines if the O2 sensor or circuit is shorted to high by checking for a rich condition during steady throttle and decel fuel cut off (DFCO)	O2 sensor voltage > 950 millivolts or O2 sensor voltage > 200 millivolts in DFCO mode	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Air/Fuel ratio ≥ 14.40 but ≤ 14.90 Throttle position ≥ 3 % but ≤ 25 % Above conditions must be met for 5.0 seconds. DFCO Test: DFCO mode must be met for 3.0 seconds. Time not in PE with Air/Fuel ratio ≤ 13.0 must exceed time in PE with Air/Fuel ≤ 13.0	560 test failures in a 600 test sample for 2 sets of samples. 110 failures in a 120 test sample for DFCO mode 100 millisecond execution rate. Continuous	Type B
HO2S Circuit Insufficient Activity (bank 1 sensor 2)	P0140	This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open.	O2 sensor > 400 millivolts but < 500 millivolts	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's DTC P0141 (O2 Heater) not set Closed Loop Fuel Enabled EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active 9 volts < Ignition Voltage < 18 volts Engine run time > 200.00 seconds Minimum 7 occurrences of a delta TP sensor > 5 % during diagnostic test.	1900 test failures in a 2000 test sample 100 millisecond execution rate. Once per key cycle.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Heater Circuit (bank 1 sensor 2)	P0141	This DTC determines if the O2 sensor heater is functioning properly by monitoring the amount of time necessary for the O2 sensor to become active after start - up.	The elapsed time to obtain ± 150 millivolts from the average O2 bias voltage. *Time based on table: Time vs average engine airflow during warm-up period. Offset to maximum time based on start-up coolant temperature.	No Bank 1 Sensor 2 voltage DTC's Engine cold start determined Avg MAF during warmup < 25 gps 10.0 < System Voltage < 18.0 399 mvolts < Avg Bias Voltage < 499 mvolts Cold start determination Based on last engine running ECT - startup ECT ≥ delta temperature (table lookup based on last engine running ECT)	From cold start to a maximum time of 200 seconds. *Time determined by table.	Type B
HO2S Closed Loop Rationality Bank 2 Sensor 1	P0150	This DTC determines if the O2 sensor voltage is not meeting the voltage criteria to enable closed loop fueling.	Closed loop fuel control O2 sensor Ready flag set to "Not Ready." O2 sensor voltage must be > 500 millivolts or < 350 millivolts to set closed loop fuel O2 Ready flag. Once set to "Ready," the O2 sensor voltage cannot be > 350 millivolts and < 500 millivolts for > 120 seconds or the O2 Ready flag will be reset to "Not Ready." Both Bank 1 Sensor 1 and Bank 2 Sensor 1 O2 sensor Ready flags must be set to Ready to enable closed loop fueling.	No injector DTC's No MAF DTC's No TP sensor DTC's No MAP DTC's No ECT sensor DTC's No Bank 1 Sensor 1 or Bank 2 Sensor 1 DTC's Engine Run Time > 120 sec. Coolant temp > 75 C Predicted O2 Heater Temp > 600 C 9 volts < Ignition Voltage < 18 volts Traction control not active. Catalyst Protection mode not active. 500 ≤ RPM ≤ 5000 3.0 gps ≤ MAF ≤ 30.0 gps Decel Fuel Cut Off not active. Power Enrichment not active. Above conditions must be met for 5.0 seconds.	160 test failures in a 200 test sample. 100 millisecond execution rate. Continuous	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit Low Voltage (bank 2 sensor 1)	P0151	This DTC determines if the O2 sensor or circuit is shorted to low by checking for a lean condition during steady throttle and power enrichment (PE).	O2 sensor voltage < 75 millivolts or O2 sensor voltage < 575 millivolts in PE mode	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled No injectors are disabled 9 volts < Ignition Voltage < 18 volts Air/Fuel ratio ≥ 14.5 but ≤ 14.8 Throttle position ≥ 3 % but ≤ 25 % Above conditions must be met for 3.0 seconds. PE Test: No injectors are disabled PE mode active Above conditions must be met for 2.0 seconds.	475 test failures in a 500 test sample for 2 sets of samples 76 failures in a 80 test sample for PE mode. 100 millisecond execution rate. Continuous	Type B
HO2S Circuit High Voltage (bank 2 sensor 1)	P0152	This DTC determines if the O2 sensor or circuit is shorted to high by checking for a rich condition during steady throttle and decel fuel cut off (DFCO)	O2 sensor voltage > 900 millivolts or O2 sensor voltage > 200 millivolts in DFCO mode	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Air/Fuel ratio ≥ 14.40 but ≤ 14.90 Throttle position ≥ 3 % but ≤ 25 % Above conditions must be met for 3.0 seconds. DFCO Test: DFCO mode must be met for 3.0 seconds. Time not in PE with Air/Fuel ratio ≤ 13.0 must exceed time in PE with Air/Fuel ≤ 13.0	475 test failures in a 500 test sample for 2 sets of samples. 110 failures in a 120 test sample for DFCO mode 100 millisecond execution rate. Continuous	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit Slow Response (bank 2 sensor 1)	P0153	This DTC determines if the O2 sensor functioning properly by checking its response time.	O2 sensor average transition time: L/R > 200.0 msec R/L > 200.0 msec O2 voltage between 325 mv and 625 mv.	No misfire DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No AIR DTC's No Bank 1 Sensor 1 Voltage DTC's DTC P0155 (O2 Heater) not set DTC P1153 (Too Few Switches) not set EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Engine Run Time > 202 sec. Coolant temp > 75 C 1200 < RPM < 2300 15.0 gps < MAF < 35.0 gps Throttle position ≥ 3 % Transmission not in Park, Reverse or Neutral Above conditions met for 3.0 seconds.	90.00 seconds Once per key cycle	Type B
HO2S Circuit Insufficient Activity (bank 2 sensor 1)	P0154	This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open.	O2 sensor > 400 millivolts but < 500 millivolts	No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No AIR DTC's No ECT sensor DTC's EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active 9 volts < Ignition Voltage < 18 volts Engine run time > 200 seconds Minimum of 4 occurrences of a delta TP sensor > 5 % during diagnostic test.	570 test failures in a 600 test sample 100 millisecond execution rate. Continuous	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Heater Circuit (bank 2 sensor 1)	P0155	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	The heater current is < 0.040 amps or > 0.800 amps.	Heater driver DTC P0030, P1031, P1032 not set Delta ignition voltage during current measurement < 1 volt Engine Run Time > 300 seconds ECT > 75 °C 1000 < RPM < 2800 10 gps < MAF < 35 gps O2 heater overtemp control not active. Above conditions must be met for 3.0 seconds.	Average of 10 current samples compared to thresholds for each test. 5 tests per key cycle, 120 second delay between tests. 1 second execution rate.	Type B
Fuel Trim System Lean - Bank 1	P0171	fuel trim limits exceeded - lean (bank 1)	short term $\geq$ 1.249 long term $\geq$ 1.249	MAF Rationality DTC not failing No MAP DTC's failing No TP sensor DTC's failing No O2 sensor DTC's failing No injector fault DTC's failing No misfire DTC's failing No knock sensor DTC's failing No EGR flow DTC's failing No Idle/IAC DTC's failing No CAM sensor DTC failing Baro > 75 kpa 20 °C< ECT < 115°C 3 g/sec < Mass Airflow < 60 g/sec 15 kpa < MAP < 85 kPa -20 °C < Intake Air Temp < 100 °C 500 rpm < Engine Speed < 4000 rpm TP sensor < 65% Vehicle Speed < 131 kph P0401 status = not in progress	11 test fails frequency: 250 ms cont.	Type B
Fuel Trim System Rich - Bank 1	P0172	fuel trim limits exceeded - rich (bank 1)	short term $\leq$ 0.749 long term $\leq$ 0.749	MAF Rationality DTC not failing No MAP DTC's failing No TP sensor DTC's failing No O2 sensor DTC's failing No injector fault DTC's failing No misfire DTC's failing No knock sensor DTC's failing No EGR flow DTC's failing No Idle/IAC DTC's failing No CAM sensor DTC failing Baro > 75 kpa 20 °C< ECT < 115°C 3 g/sec < Mass Airflow < 60 g/sec 15 kpa < MAP < 85 kPa -20 °C < Intake Air Temp < 100 °C 500 rpm < Engine Speed < 4000 rpm TP sensor < 65% Vehicle Speed < 131 kph P0401 status = not in progress	6 test fails frequency: 250 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Fuel Trim System Lean - Bank 2	P0174	fuel trim limits exceeded - lean (bank 2)	short term ≥ 1.249 long term ≥ 1.249	MAF Rationality DTC not failing No MAP DTC's failing No TP sensor DTC's failing No O2 sensor DTC's failing No injector fault DTC's failing No misfire DTC's failing No knock sensor DTC's failing No EGR flow DTC's failing No Idle/IAC DTC's failing No CAM sensor DTC failing Baro > 75 kpa 20 °C< ECT < 115°C 3 g/sec < Mass Airflow < 60 g/sec 15 kpa < MAP < 85 kPa -20 °C < Intake Air Temp < 100 °C 500 rpm < Engine Speed < 4000 rpm TP sensor < 65% Vehicle Speed < 131 kph P0401 status = not in progress	11 test fails frequency: 250 ms cont.	Type B
Fuel Trim System Rich - Bank 2	P0175	fuel trim limits exceeded - (bank 2)	short term ≤ 0.749 long term ≤ 0.749	MAF Rationality DTC not failing No MAP DTC's failing No TP sensor DTC's failing No O2 sensor DTC's failing No injector fault DTC's failing No misfire DTC's failing No knock sensor DTC's failing No EGR flow DTC's failing No Idle/IAC DTC's failing No CAM sensor DTC failing Baro > 75 kpa 20 °C< ECT < 115°C 3 g/sec < Mass Airflow < 60 g/sec 15 kpa < MAP < 85 kPa -20 °C < Intake Air Temp < 100 °C 500 rpm < Engine Speed < 4000 rpm TP sensor < 65% Vehicle Speed < 131 kph P0401 status = not in progress	6 test fails frequency: 250 ms cont.	Type B
Fuel Injector 1 Control Circuit	P0201	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.5 for 5 seconds ALDL mode $AE state = inactive	10 failures out of 20 samples frequency: 250 ms cont.	Type B
Fuel Injector 2 Control Circuit	P0202	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.5 for 5 seconds ALDL mode $AE state = inactive	10 failures out of 20 samples frequency: 250 ms cont.	Type B
Fuel Injector 3 Control Circuit	P0203	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.5 for 5 seconds ALDL mode $AE state = inactive	10 failures out of 20 samples frequency: 250 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Fuel Injector 4 Control Circuit	P0204	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.5 for 5 seconds ALDL mode $AE state = inactive	10 failures out of 20 samples frequency: 250 ms cont.	Type B
Fuel Injector 5 Control Circuit	P0205	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.5 for 5 seconds ALDL mode $AE state = inactive	10 failures out of 20 samples frequency: 250 ms cont.	Type B
Fuel Injector 6 Control Circuit	P0206	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.5 for 5 seconds ALDL mode $AE state = inactive	10 failures out of 20 samples frequency: 250 ms cont.	Type B
Fuel Injector 7 Control Circuit	P0207	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.5 for 5 seconds ALDL mode $AE state = inactive	10 failures out of 20 samples frequency: 250 ms cont.	Type B
Fuel Injector 8 Control Circuit	P0208	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.5 for 5 seconds ALDL mode $AE state = inactive	10 failures out of 20 samples frequency: 250 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Engine Misfire Detected	P0300	This DTC will determine if a misfire is occurring by monitoring crankshaft velocity.	Deceleration index vs Engine Speed vs Load and Camshaft Position FTP Threshold Fed. = 1.8% Lev. = 1.3% Catalyst Damage 1.875% to 10%	Engine run time > 0 No VSS DTC's No crank sensor DTC's No TP sensor DTC's No EST sensor DTC's No ECT sensor DTC's No CAM sensor DTC's No transmission DTC's No MAF DTCs Fuel cutoff not active Brake torque management not active Fuel level > 9% (Does not disable if a Fuel system DTC is active) Fuel Delay when below minimum level = 200 cycles ECT > -7 °C but < 131.00 ° C If start up ECT below -7°C, then delayed until ECT above 21°C Engine speed > 500 RPM but < 6500.00 RPM System voltage > 9.00 volts but < 18.00 volts + Throttle position Δ < 0.566 % / 100ms - Throttle position Δ < 0.566 %/100ms No ABS - Rough Road No ABS or TCS active No abnormal engine speed Engine speed not changing rapidly - Ratio of consecutive positive peak delta ref times to nonconsecutive peaks < 20 A/C compressor has not just engaged or disengaged AIR / EGR intrusive test not active Automatic transmission is not shifting	Emission Level Exceedence = (5) failed 200 revolution blocks out of 16. Failure reported with (1) Exceedence in 1st (16) 200 revolution block, or (4) Exceedences thereafter. Catalyst Damaging Exceedence = (1) failed 200 revolution block. Failure reported with (3) Exceedences in FTP, or (1) Exceedence outside FTP. Continuous	DTC Type B *EMISSION* DTC Type B *CATALYST DAMAGING*
Knock Sensor Circuit	P0325	rationality	Knock activity ≥ 100 ms	Ignition 1 voltage ≥ 11 volts Time since PCM powered ≥ 5 sec. Engine speed ≥ 600 rpm Engine run time ≥ 30 seconds	3 sec. frequency: 250 ms cont.	Type B
Knock Sensor Circuit Excessive Spark Retard	P0326	performance check	Knock fast retard ≥ a value f(MAP, RPM)	Knock detection = enabled	35 failures out of 40 samples frequency: 100 msec cont.	Type B
Knock Sensor Circuit Low Voltage - Bank 1	P0327	range check	Knock sensor background noise - learned min. noise ≤ .5V	Ignition voltage Present ECT. ≥ 40 °C Ignition 1 Voltage ≥ 11V Throttle Angle ≥ 5deg. Engine Speed ≥ 3000 RPM	1 sec frequency: 250 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Crank Sensor A Circuit	P0335	24X Signal This diagnostic determines whether a fault exists with crank position sensor circuit A signal	The number of medium resolution reference pulses with or without CAM present ≤ 47 or ≥ 49.	PCM state = crank or run MAF > 2.5 gps 20 RPM ≤ CAM RPM Cranking ≤ 400 RPM 100 RPM ≤ CAM RPM Cranking ≤ 6000 RPM 20 RPM ≤ Med. Res. RPM Crank ≤ 400 RPM 100 RPM ≤ Med. Res. RPM Crank ≤ 6000 RPM	No CAM faults present: Crank > 1 fail count Run > 1 fail count CAM fault present: Crank > 2 sec. Run > .6 sec. 12.5 msec Continuous	Type B
Crank Sensor A Circuit Performance	P0336	24X Signal This diagnostic determines if the signal is corrupted (ie excessive noise is present) on the crank position sensor A circuit.	The number of loss of match occurences is ≥ 6 within 85 cylinder events.	PCM state = crank or run Decode mode = Time based A P0385 active No cam faults present	Execute at low resolution interrupt	Type B
Camshaft Position Sensor Circuit	P0340	circuit continuity	Low resolution with no cam pulse ≥ 9	4X reference pulses = received	Number of mismatch > 8. of 50 frequency: 250 ms cont.	Type B
Camshaft Position Sensor Circuit Performance	P0341	This diagnostic determines if the signal is corrupted (ie excessive noise is present or phase shift) on the camshaft position sensor circuit.	More than 8 cam events out of 50 have occurred outside of the correct 24X region.	PCM state = crank or run Calculated low resolution RPM < 2000 24X region between 1 and 5	137.5 msec max. frequency: 12.5 msec.	Type B
Ignition Coil 1 Control Circuit	P0351	This DTC detects when the circuit is shorted to ground Circuit check	Fault flag indicated.	Ignition 1 is powered	5 failures for 10 cylinder events	Type B
Ignition Coil 2 Control Circuit	P0352	This DTC detects when the circuit is shorted to ground Circuit check	Fault flag indicated.	Ignition 1 is powered	5 failures for 10 cylinder events	Type B
Ignition Coil 3 Control Circuit	P0353	This DTC detects when the circuit is shorted to ground Circuit check	Fault flag indicated.	Ignition 1 is powered	5 failures for 10 cylinder events	Type B
Ignition Coil 4 Control Circuit	P0354	This DTC detects when the circuit is shorted to ground Circuit check	Fault flag indicated.	Ignition 1 is powered	5 failures for 10 cylinder events	Type B
Ignition Coil 5 Control Circuit	P0355	This DTC detects when the circuit is shorted to ground Circuit check	Fault flag indicated.	Ignition 1 is powered	5 failures for 10 cylinder events	Type B
Ignition Coil 6 Control Circuit	P0356	This DTC detects when the circuit is shorted to ground Circuit check	Fault flag indicated.	Ignition 1 is powered	5 failures for 10 cylinder events	Type B
Ignition Coil 7 Control Circuit	P0357	This DTC detects when the circuit is shorted to ground Circuit check	Fault flag indicated.	Ignition 1 is powered	5 failures for 10 cylinder events	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Ignition Coil 8 Control Circuit	P0358	This DTC detects when the circuit is shorted to ground Circuit check	Fault flag indicated.	Ignition 1 is powered	5 failures for 10 cylinder events	Type B
Crank Sensor B Circuit	P0385	24X Signal This diagnostic determines whether a fault exists with crank position sensor circuit B signal	The number of medium resolution reference pulses with or without CAM present ≤ 47 or ≥ 49.	PCM state = crank or run MAF > 2.5 gps 20 RPM ≤ CAM RPM Cranking ≤ 400 RPM 100 RPM ≤ CAM RPM Cranking ≤ 6000 RPM 20 RPM ≤ Med. Res. RPM Crank ≤ 400 RPM 100 RPM ≤ Med. Res. RPM Crank ≤ 6000 RPM	No CAM faults present: Crank > 1 fail count Run > 1 fail count CAM fault present: Crank > 2 sec. Run > .6 sec. 12.5 msec Continuous	Type B
Crank Sensor B Circuit Performance	P0386	24X Signal This diagnostic determines if the signal is corrupted (ie excessive noise is present) on the crank position sensor B circuit.	The number of loss of match occurences is ≥ 6 within 85 cylinder events.	PCM state = crank or run Decode mode = Time based B P0335 active No cam faults present	Execute at low resolution interrupt	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Exhaust Gas Recirculation -- Insufficient Flow Detected	P0401	This diagnostic will determine if there is a reduction in EGR flow.	With EGR valve open, the peak + MAP ∆is monitored over a period of time. This value is compared with a threshold from an engine speed vs BARO table and the difference computed. The result is statistically filtered (EWMA) and compared to a decision limit. DTC is set when the filtered result exceeds the decision limit.	Test Enable: No TP sensor DTC's failing. No MAP sensor DTC's failing. No VS sensor DTC's failing. No ECT sensor DTC's failing. No IAC DTC's failing. No LEGR pintle pos. DTC failing. 80 °C ≤ ECT ≤ 110 °C. BARO ≥ 72 kPa. 35 kph≤ vehicle speed. IAC delta ≤ 3 counts. trans. state unchanged for 0.3 sec.. A/C state unchanged for 0.3 sec.. 11 volts ≤ sys. volts ≤ 18 volts. IAT < 50°C Start Test (decel): TP sensor ≤ 1.2% EGR pos. ≤ 3%. 700≤ Engine RPM ≤ 1200. Delta MAP ≤ 2 kPa. 11 ≤ MAP ≤ 50 kPa. The above conditions must be present for 1.0 consecutive sec.. Run Test (decel): Stabilized MAP (valve closed) recorded and EGR valve “ramped” open over a time interval and peak MAP value recorded and MAP computed. EGR valve “ramped” closed over a time interval. Response Test: IF the difference between the current EWMA and the current map diff > 1.0 kpa THEN 3 tests will be run per trip until 10 tests have been met.	1 test per trip 15 tests if KAM reset frequency: 100 ms. cont.	Type A
EGR Valve Control Circuit	P0403	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	9 V < System Voltage < 18 V Engine Speed > 425 RPM	100 fails out of 120 samples	Type B
EGR Circuit Performance	P0404	functional check	Pintle position error > 20% for 100 occurrences	Desired EGR Position > 0 cnts Code P0401 status = not in progress ∆Desired EGR Position < 30% Ignition Voltage ≥ 11.7 volts	100 occurrences frequency: 250 ms cont./ position error every 12.5 ms. cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
EGR Sensor Circuit Low Voltage	P0405	Circuit check	Filtered Closed Valve Pintle Position ≤ 2.2%	Ignition Voltage ≥ 11.7 volts	2 seconds frequency: 250 ms cont./ position error every 12.5 ms. cont.	Type B
AIR System	P0410	***Passive***: Part 1 HO2S sensors indicate lean condition present during open loop operation. Verifies proper operation of AIR pump. Part 2 Monitors the transition from open loop to closed loop to verify O2 sensor activity indicating that the AIR pumps have turned off. ***Active:*** HO2S sensors indicate lean condition present when AIR pump is turned on during closed loop operation	***Passive:*** Part 1 HO2S sensor > approx. 740 mv during open loop operation 50% of the time. Part 2 HO2S sensor does not toggle above 740 mv at least 100 times in 25 seconds. ***Active:*** HO2S sensor > 31.25 mv for > 1.9 seconds or fuel integrator delta of.07when pump turned on during closed loop operation.	***General Enable:*** No MAF DTC's set No MAP DTC's set No IAT DTC's set No ECT DTC's set No TP sensor DTC's set No HO2S DTC's set No Injector DTC's set No Misfire DTC's set No CKP DTC's set No EGR DTC's set No Fuel Trim DTC's set No IAC DTC's set No AIR pump relay DTC's set No AIR Solenoid DTC's set No EVAP DTC's set 0°C < IAT < 60.5°C 0°C < ECT < 60.5°C Ignition voltage > 9.5V for a time > 10 seconds Engine Run Time > 3 seconds Airflow < 35 g/s Exhaust backpressure < 79.9% A/F Ratio > 12.1:1 ∆TPS < 9.9% MAP > 50.5 kpa PE, COT, DFCO Not Active **Passive Part 1** Air Pumps = on A/F State = Open Loop **Passive Part 2** Air Pumps = off A/F State = Closed Loop **Active** Passive Test = Fail or inconclusive A/F State = Closed Loop Fuel integrator > 0.95 & < 1.05 BLM cell is valid RPM > 600 RPM Engine Load < 79.9%	***Passive:*** During open loop operation. Once per trip. ***Active:*** 3 seconds Up to 3 times per trip if passive test fails or is inconclusive.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
AIR Solenoid Relay Control Circuit - Bank 1	P0412	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	8V < System Voltage < 18 V Engine Speed > 425RPM	100 fails out of 120 samples	Type B
AIR Pump Relay Control Circuit - Bank 1	P0418	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	8V < System Voltage < 18 V Engine Speed > 425RPM	100 fails out of 120 samples	Type B
AIR Pump Relay Control Circuit - Bank 2	P0419	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	8V < System Voltage < 18 V Engine Speed > 425RPM	100 fails out of 120 samples	Type B
Catalyst Low Efficiency - Bank 1	P0420	Oxygen Storage	OSC Time Difference ≥ 0.138672 sec. (LD8 & L37) OSC Time Difference ≥ 0.09082 sec. (L47) OSC Time Difference = OSC Worst Pass Thresh. - OSC Compensation factor * (Post Cat O2 Resp Time - Pre Cat O2 Resp Time) OSC Worst Pass Thresh = 1.85 sec. (LD8 & L37) OSC Worst Pass Thresh = 1.375 sec. (L47)	No ECT DTCs failing No Fuel Trim DTC's failing No IAC DTC's failing No IAT DTC's failing No MAF DTC's failing No MAP DTC's failing No Oxygen Sensor (Bank 1 Sensor 1, Bank 2 Sensor 1, or Bank 3 Sensor 3) DTC's failing No Purge System DTC's failing No TP Sensor DTC's failing No VSS DTC's failing No Misfire DTC's failing Valid Idle Period Criteria Engine Speed ≥ 900 RPM for minimum of 37 sec since end of last idle period. (LD8, L37) Engine Speed ≥ 900 RPM for minimum of 40 sec since end of last idle period. (L47) Minimum engine runtime for stable BLM & PLM ≥ 450 sec. Test Enable Conditions Pred. Catalyst Temperature ≥ 430 ºC Closed loop fuel control BARO ≥ 75 kPa -6.25 ≤ IAT ≤ 200 ºC 71 ≤ ECT ≤ 120 ºC 0 < Idle Period ≤ 180 sec. Tests Attempted this trip ≤ 12 Tests Attempted this idle period < 1 -65 rpm ≤ (Engine Speed - Desired Speed) ≤ 65 rpm Rapid Step Response Enable Criteria: OSC Time Difference Step ≥ 0.452148 sec. (LD8 & L37) OSC Time Difference Step ≥ 0.297539 sec. (L47) OSC Time Difference ≥ 0.000 sec	1 test attempted per valid idle period. Minimum of 1 test per trip. Maximum of 6 tests per trip. Maximum of 6 trips to detect failure when rapid step response is enabled. frequency: 12.5 ms cont.	Type A

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Evap. Emission Control System - Malfunction	P0440	This DTC will detect a weak vacuum condition (large leak or purge blockage) in the Evap. system.	Purge Volume > 3 liters BEFORE Tank Vacuum > 8.0 “H2O	General Test Enable: No IAT DTC's active No MAP DTC's active No TP sensor DTC's active No O2 sensor DTC’s active No VS sensor DTC’s active No ECT sensor DTC’s active DTC P0125 not active 15 % < Fuel Level < 85 % 10 V < System Voltage < 18 V 4 °C < IAT < 30 °C Baro > 72.5 kPa (8000 ft) Engine Coolant Temp. < 30 °C Cold Temperature Δ (ECT - IAT): < 8 °C if IAT > ECT < 8 °C if ECT > IAT	Once per cold start. Time is dependent on driving conditions.	Type B
Evap. Emission System Leak Detection (Small Leak)	P0442	This DTC will detect a small leak in the evap system between the fuel fill cap and up to the purge solenoid.	.040 EWMA Value > .0271 in. dia. (Eldorado .040 EWMA Value > .025894 in. dia.)	General Test Enable: No IAT DTC's active No MAP DTC's active No TP sensor DTC's active No O2 sensor DTC’s active No VS sensor DTC’s active No ECT sensor DTC’s active DTC P0125 not active 15 % < Fuel Level < 85 % 10 V < System Voltage < 18 V 4 °C < IAT < 30 °C Baro > 72.5 kPa (8000 ft) Engine Coolant Temp < 30 °C Cold Temperature Δ (ECT - IAT): < 8 °C if IAT > ECT < 8 °C if ECT > IAT	Once per cold start. Time is dependent on driving conditions. Maximum of 6 trips to detect failure with EWMA.	Type A
Canister Purge Circuit Fault	P0443	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	8V < System Voltage < 18 V Engine Speed > 425RPM	100 fails out of 120 samples	Type B
Evap. Emission Control System - Vent Control Malfunction	P0446	This DTC will determine if a restriction is present in the vent solenoid, vent filter, vent hose or canister.	Tank Vacuum > 10” H2O for 5 seconds BEFORE Purge Volume > 4 liters	No IAT DTC's active No MAP DTC's active No TP sensor DTC's active No O2 sensor DTC’s active No VS sensor DTC’s active No ECT sensor DTC’s active DTC P0125 not active 15 % < Fuel Level < 85 % 10 V < System Voltage < 18 V 4 °C < IAT < 30 °C Engine Coolant Temp < 32.20313 °C Baro > 72.5 kPa (8000 ft)	Once per trip. Time is dependent on driving conditions.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Fuel Tank Vent Circuit Fault	P0449	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	8V < System Voltage < 18 V Engine Speed > 425RPM	100 fails out of 120 samples	Type B
Evap. Fuel Tank Pressure Sensor Circuit Low Voltage	P0452	This DTC will detect a vacuum sensor signal that is too low out of range.	Fuel Tank Pressure Sensor Circuit Voltage < 0.099609 volts	1 second delay after sensor power-up for sensor warm up.	1.5 seconds continuous. frequency: Runs continuously every 100 ms after delay period for sensor warm-up.	Type B
Evap. Fuel Tank Pressure Sensor Circuit High Voltage	P0453	This DTC will detect a vacuum sensor signal that is too high out of range.	Fuel Tank Pressure Sensor Circuit Voltage > 4.900391 volts	1 second delay after sensor power-up for sensor warm up.	1.5 seconds continuous. frequency: Runs continuously every 100 ms after delay period for sensor warm-up.	Type B
Fuel Level Sensor Circuit Performance	P0461	rationality check	Fuel level delta < 2 liters within 100 kilometers	No fuel level DTC's set	12.5 ms Continuous	Type C
Fuel Level Sensor Circuit Low Input	P0462	This diagnostic will detect a fuel sender failed to a low voltage level.	Output voltage amplitude is low and stays constant	Discrete: Fuel level input < 15.5 % OR ClassII/UART: Communication between the cluster and PCM is lost Default to gauge: 0 % Default to evap and misfire: 40%	12.5 ms Continuous Failed for 5 consecutive seconds	Type C
Fuel Level Sensor Circuit High Input	P0463	This diagnostic will detect a fuel sender failed to a high voltage level.	Output voltage amplitude is high and stays constant	Discrete: Fuel level input > 51.3 % OR ClassII/UART: Communication between the cluster and PCM is lost Default to gauge: 0% Default to evap and misfire: 40%	12.5 ms Continuous Failed for 5 consecutive seconds	Type C
Engine Cooling Fan Relay 1 Control Circuit	P0480	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	8V < System Voltage < 18 V Engine Speed > 425RPM	100 fails out of 120 samples	Type B
Engine Cooling Fan Relay 2 Control Circuit	P0481	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	8V < System Voltage < 18 V Engine Speed > 425RPM	100 fails out of 120 samples	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Vehicle Speed Sensor Circuit Low	P0502	Circuit check - low input	Raw OSS ≤ 100 RPM Note: Raw OSS = OSS/FDR	No IMS DTC's failing No TP sensor DTC's failing No ISS DTC's failing No DTC P0503 failure Engine Torque not defaulted Gear Range ≠ Park or Neutral TP sensor ≥ 12% 60 N-m ≤ Engine Torque ≤ 395 N-m 8 V ≤ System Voltage ≤ 18 V 450 ≤ Engine RPM ≤ 7500 for 5 sec. & not in Fuel Cut-off 1000 ≤ ISS ≤ 5000 RPM ≥ 5 sec.	3 sec. Frequency: 25 ms cont.	Type B
Vehicle Speed Sensor Intermittent Performance	P0503	This diagnostic detects unrealistically large ΔVSS with no gear range change -- rationality	Drop in raw OSS ≥ 350 RPM in one execution loop.	No IMS DTC's failing No ISS DTC's failing No DTC P1843 failure Gear Range ≠ Park or Neutral Last manual range Δ ≥ 6 sec. 450 ≤ Engine RPM ≤ 7500 for 5 sec. & not in Fuel Cut-off Raw OSS > 400 RPM ≥ 2.0 sec +ΔOSS ≤ 500 RPM ≥ 2.0 sec ΔISS, loop-to-loop ≤ 500 RPM for ≥ 4.8 sec.	1.0 sec. Frequency: 25 ms cont.	Type B
Idle System Low	P0506	functional check	Idle rpm > 100 rpm below desired rpm based on coolant temperature.	General Test Enable: No MAF DTC's failing. No MAP DTC's failing. No IAT DTC's failing. No ECT DTC's failing. No TP sensor DTC's failing. No injector fault DTC's failing. No VS sensor DTC's failing. No EGR pintle pos. DTC failing. No purge flow DTC's failing. No 4x reference DTC's failing. EGR diag. test not in progress. 10.5 ≤ System volt ≤18 volts. IAT ≥ -40 °C BARO ≥ 65 kPa -40 °C ≤ ECT≤ 110 °C Engine run time ≥ 120 sec. Closed loop fueling enabled Idle test: General conditions met. vehicle speed ≤ 3 kph. TP sensor ≤ 1.5% Time since a transition to or from park/neutral > 3 sec.. Time since TCC mode change > 3 sec.	idle test - 3 sec. frequency: 250 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Idle System High	P0507	functional check	Idle rpm > 175 RPM above desired RPM based on coolant temperature.	General Test Enable: No MAF DTC's failing. No MAP DTC's failing. No IAT DTC's failing. No ECT DTC's failing. No TP sensor DTC's failing. No injector fault DTC's failing. No VS sensor DTC's failing. No EGR pintle pos. DTC failing. No purge flow DTC's failing. No 4x reference DTC's failing. EGR diag. test not in progress. 10.5 ≤ System volt ≤18 volts. IAT ≥ -40 °C BARO ≥ 65 kPa -40 °C ≤ ECT≤ 110 °C Engine run time ≥ 120 sec. Closed loop fueling enabled Idle test: General conditions met. vehicle speed ≤ 3 kph. TP sensor ≤ 1.5% Time since a transition to or from park/neutral > 3 sec.. Time since TCC mode change > 3 sec.	idle test - 3 sec. frequency: 250 ms cont.	Type B
PCM Memory	P0601	functional check	Computed EPROM checksum not equal to expected	Code P0601 has never previously failed	1 failure Background loop cont.	Type A
PCM not Programmed	P0602	functional check	Calibration parameter not equal to expected value	None	1 failure 250 ms cont.	Type A
PCM Memory - RAM	P0604	functional check	Bad RAM location found	DTC P0604 not failed.	1 failure if found during first test in ignition cycle. 3 failures if found during subsequent tests in the ignition cycle. Continuous	Type A
Transmission Internal Mode Switch state = Illegal Range	P0705	This DTC detects when the transmission IMS indicates an illegal range	Illegal Range Switch State	8 V < System Voltage < 18 V	5 sec. continuous	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Trans. Fluid Temperature Sensor Circuit - Range/Performance	P0711	Rationality	1 - Transmission Fluid Temp. has not changed ≥ 2°C (absolute value) since start-up. 2 - Transmission Fluid Temp. changes > 20°C (absolute value) in 200 msec.	No ECT Sensor DTC's failing No ISS DTC's failing No VSS DTC's failing 8V ≤ System Voltage ≤ 18V -38°C ≤ Transmission Fluid Temp.≤ 149°C 450 ≤ Engine RPM ≤ 7500 for 5 sec. & not in Fuel Cut-off Vehicle speed ≥ 5 mph continuously for ≥ 900 sec. at least once this ignition cycle. TCC slip ≥ 120 rpm continuously for ≥ 900 sec. at least once this ignition cycle. Trans. temp at startup between -38 and 21°C. Coolant temp ≥ 70° C. Engine Coolant Temp. has changed by ≥ 50° C. since startup.	1 - 100 seconds 2 - 14 times in 7 sec. Frequency : 200ms cont.	Type C
Transmission Fluid Temperature Sensor Circuit Low Voltage	P0712	This DTC detects when the transmission fluid temperature sensor circuit is open or shorted to ground.	Transmission Fluid Temp. ≥ 149° C.	8V ≤ System Voltage ≤ 18V 450 ≤ Engine RPM ≤ 7500 for 5 sec. & not in Fuel Cut-off	10 sec. Frequency : 200ms cont.	Type C
Transmission Fluid Temperature Sensor Circuit High Voltage	P0713	This DTC detects when the transmission fluid temperature sensor circuit is shorted to + 12V	Transmission Fluid Temp. ≤ -40° C.	No VSS DTC's failing No ISS DTC's failing 8V ≤ System Voltage ≤ 18V 450 ≤ Engine RPM ≤ 7500 for 5 sec. & not in Fuel Cut-off TCC slip ≥ 50 RPM for ≥ 400 sec. cumulative Output speed ≥ 200 RPM for ≥ 300 sec. cumulative	6 sec Frequency : 200ms cont..	Type C
A/T Input Speed Sensor Circuit Performance	P0716	Detects large ΔISS -- rationality	Input speed delta ≥ 1000 RPM in one execution loop.	No SSA sol. DTC's failing No VSS DTC's failing No TP sensor DTC's failing No ISS low DTC fault act. or act. this key on SSA stuck on code counters = 0 Transmission in D4 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off Throttle Position ≥ 12% Vehicle speed ≥ 16 kph Raw ISS > 1050 RPM ≥ 2.0 sec Raw +ΔISS ≤ 500 ≥ 2.0 sec 8 V ≤ System Voltage ≤ 18 V	1.0 sec. Frequency: 25 ms cont.	Type B
A/T Input Speed Sensor Circuit No Activity	P0717	range check - low	Input speed ≤ 50 RPM	No IMS DTC failing No VSS DTC's failing Vehicle speed > 16 kph Transmission Range ≠ Park or Neutral 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8V ≤ System Voltage ≤ 18V	6 sec. Frequency: 100 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Torque Converter Clutch System Performance - Stuck Off	P0741	Detects high torque converter slip when TCC is commanded on -- rationality	Torque converter slip ≥ interpolated table look up f(torque). See below: Slip (RPM) / Torque (ft-lbs) 48 / 0 80 / 48 200 / 95 252 / 143 271 / 191 280 / 239 280 / 286 280 / 334 280 / 382	No IMS DTC failing No VSS DTC failing No TP sensor DTC failing No ISS DTC failing No TCC Stuck on DTC failing No TCC Electrical DTC failing TCC capacity ≥ 0% ≥ 5 sec Transmission range = D2, D3, or D4 10% ≤ Throttle position ≤ 50% 20° C. ≤ Transmission Fluid Temp. ≤ 133° C. 43 N-m ≤ Engine Torque ≤ 215 N-m 450 ≤ Engine RPM ≤ 7500 ≥ 5.0 sec. & not in Fuel Cut-off TCC Pressure ≥ 450 kPa ≥ 5.0 sec. Last manual range Δ ≥ 6 sec.	5 sec. Fail test count ≥ 1 Frequency: 100 ms cont.	Type B
Torque Converter Clutch System Performance - Stuck On	P0742	Detects low converter slip when TCC commanded off --rationality	-20 ≤ Slip speed ≤ 135 rpm	No IMS DTC failing No VSS DTC failing No TP sensor DTC failing No ISS DTC failing No TCC Stuck off DTC failing No TCC Electrical DTC failing TCC is commanded OFF No Engine Torque Default Transmission is in D4, not in 1st gear 14% < Throttle position ≤ 90% 155 N-m ≤ Delivered Torque ≤ 294 N-m 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 20° C. < Transmission Fluid Temp. < 133° C. 500 ≤ Engine RPM ≤ 5500 16 kph ≤ Vehicle Speed ≤ 130 kph 0.65 ≤ Diag. Trans. Ratio ≤ 1.05	5 sec. Fail Test count ≥ 2 Frequency: 100 ms cont.	Type B
Shift Solenoid A Circuit Performance	P0751	This DTC detects when 1-2 shift solenoid is stuck off	Fail Case 1 Commanded Gear = 1 1.54 ≤ Diag. Transmission Ratio ≤ 1.71 Fail Case 2 Commanded Gear = 4 0.95 ≤ Diag. Transmission Ratio ≤ 1.05	No IMS DTC failing No VSS DTC failing No TP sensor DTC failing No ISS DTC failing No Shift Solenoid Electrical DTC failing No Engine Torque Default Vehicle Speed ≥ 8 kph Transmission is in D4, D3, D2, or D1 20° C. ≤ Transmission Fluid Temp. ≤ 130° C. Throttle position ≥ 7.5% 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 80 N-m ≤ Engine Torque ≤ 395 N-m	Case 1. 1.5 sec. Case 2. 4.0 sec. Frequency: 100 ms cont.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Shift Solenoid A Circuit Performance	P0752	This DTC detects when 1-2 shift solenoid is stuck on	Fail Case 1 Commanded Gear = 2 2.87 ≤ Diag. Transmission Ratio ≤ 3.11 Fail Case 2 Commanded Gear = 3 0.65 ≤ Diag. Transmission Ratio ≤ 0.71	No IMS DTC failing No VSS DTC failing No TP sensor DTC failing No ISS DTC failing No Shift Solenoid Electrical DTC failing No Engine Torque Default Vehicle Speed ≥ 8 kph Transmission is in D4, D3, D2, or D1 20° C. ≤ Transmission Fluid Temp. ≤ 130° C. Throttle position ≥ 7.5% 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 80 N-m ≤ Engine Torque ≤ 395 N-m	Case 1. 2.0 sec. Case 2. 4.0 sec. Frequency: 100 ms cont.	Type B
Shift Solenoid B Circuit Performance	P0756	This DTC detects when 2-3 shift solenoid is stuck on	Fail Case 1 Vehicle Speed ≥ 8 kph 10% ≤ Throttle Position < 100% 80 N-m ≤ Engine Torque ≤ 395 N-m Commanded Gear = 1 0.65 ≤ Diag. Transmission Ratio ≤ 0.71 Fail Case 2 Vehicle Speed ≥ 8 kph 10% ≤ Throttle Position ≤ 100% 80 N-m ≤ Engine Torque ≤ 395 N-m Commanded Gear = 2 0.95 ≤ Diag. Transmission Ratio ≤ 1.05	No IMS DTC failing No VSS DTC failing No TP sensor DTC failing No ISS DTC failing No Shift Solenoid Electrical DTC failing Transmission is in D4, D3, D2, or D1 No Engine Torque Default 20° C. ≤ Transmission Fluid Temp. ≤ 133° C. 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off	Case 1. 1.0 sec. Case 2. 0.5 sec. Frequency: 100 ms cont.	Type A
Shift Solenoid B Circuit Performance	P0757	This DTC detects when 2-3 shift solenoid is stuck off	Fail Case 1 Vehicle Speed ≥ 8 kph 10% ≤ Throttle Position < 100% 80 N-m ≤ Engine Torque ≤ 395 N-m Commanded Gear = 3 1.54 ≤ Diag. Transmission Ratio ≤ 1.71 Fail Case 2 Vehicle Speed ≥ 8 kph 10% ≤ Throttle Position ≤ 100% 10 N-m ≤ Engine Torque ≤ 395 N-m Engine speed ≤ 7500 RPM Commanded Gear = 4 2.87 ≤ Diag. Transmission Ratio ≤ 3.11	No IMS DTC failing No VSS DTC failing No TP sensor DTC failing No ISS DTC failing No Shift Solenoid Electrical DTC failing Transmission is in D4, D3, D2, or D1 No Engine Torque Default 20° C. ≤ Transmission Fluid Temp. ≤ 133° C. 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off	Case 1. 3.0 sec. Case 2. 2.0 sec. Frequency: 100 ms cont.	Type A
HO2S Heater Current Monitor Control Circuit Sensors 1	P1031	This DTC detects when the circuit is shorted to +12V. -- Circuit check	Circuit fault indicated	9 V < System Voltage < 18 V Engine Speed > 425 RPM	100 fails out of 120 samples	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Heater Warm Up Control Circuit Sensors 1	P1032	This DTC detects when the circuit is open, shorted to ground or shorted to +12V. -- Circuit check	Circuit fault indicated	9 V < System Voltage < 18 V Engine Speed > 425 RPM	100 fails out of 120 samples	Type B
HO2S Circuit Insufficient Switching (bank 1 sensor 1)	P1133	This DTC determines if the O2 sensor functioning properly by monitoring the number of L/R and R/L switches.	Number of switches in 90.00 seconds: L/R switches < 5 R/L switches < 5 O2 voltage between 325 millivolts and 625 millivolts	No misfire DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No AIR DTC's No Bank 1 Sensor 1 Voltage DTC's DTC P0135 (O2 Heater) not set EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Engine Run Time > 202 sec. Coolant temp > 75 C 1200 < RPM < 2800 15.0 gps < MAF < 35.0 gps Throttle position ≥ 3 % Transmission not in Park, Reverse or Neutral Above conditions met for 3.0 seconds.	90 seconds after closed loop enable Once per key cycle	DTC Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit Transition Time Ratio (bank 1 sensor 1)	P1134	This DTC diagnoses degraded slow rich to lean or lean to rich response times.	Ratio of average response times. Ratio > 4.5 or < 0.50 O2 voltage between 325 millivolts and 625 millivolts	No misfire DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No AIR DTC's No Bank 1 Sensor 1 Voltage DTC's DTC P0135 (O2 Heater) not set DTC P1133 (Too Few Switches) not set EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Engine Run Time > 202 sec. Coolant temp > 75 C 1200 < RPM < 2800 15.0 gps < MAF < 35.0 gps Throttle position ≥ 3 % Transmission not in Park, Reverse or Neutral Above conditions met for 3.0 seconds.	90 seconds after closed loop enable Once per key cycle	DTC Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit Insufficient Switching (bank 2 sensor 1)	P1153	This DTC determines if the O2 sensor functioning properly by monitoring the number of L/R and R/L switches.	Number of switches in 90.00 seconds: L/R switches < 5 R/L switches < 5 O2 voltage between 325 millivolts and 625 millivolts	No misfire DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No AIR DTC's No Bank 2 Sensor 1 Voltage DTC's DTC P0155 (O2 Heater) not set EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Engine Run Time > 202 sec. Coolant temp > 75 C 1200 < RPM < 2800 15.0 gps < MAF < 35.0 gps Throttle position ≥ 3 % Transmission not in Park, Reverse or Neutral Above conditions met for 3.0 seconds.	90 seconds after closed loop enable Once per key cycle	DTC Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit Transition Time Ratio (bank 2 sensor 1)	P1154	This DTC diagnoses degraded slow rich to lean or lean to rich response times.	Ratio of average response times. Ratio > 4.5 or < 0.50 O2 voltage between 325 millivolts and 625 millivolts	No misfire DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No AIR DTC's No Bank 2 Sensor 1 Voltage DTC's DTC P0155 (O2 Heater) not set DTC P1153 (Too Few Switches) not set EGR Flow diag. test not active AIR diag. test not active Catalyst diag. test not active Closed Loop Fuel Enabled 9 volts < Ignition Voltage < 18 volts Engine Run Time > 202 sec. Coolant temp > 75 C 1200 < RPM < 2800 15.0 gps < MAF < 35.0 gps Throttle position ≥ 3 % Transmission not in Park, Reverse or Neutral Above conditions met for 3.0 seconds.	90 seconds after closed loop enable Once per key cycle	DTC Type B
Engine Metal Overtemperature Protection	P1258	activity check	Engine Overtemperature mode activity status = active	None	8 sec. frequency: 500 ms cont.	Type A
Crankshaft Position System Variation Not Learned	P1336	The DTC will determine if the matching tolerance in the crankshaft system has been learned by the vehicle	Sum of compensation factors not within range	PCM state = run	0.50 sec 100ms loop continuous	Type A
Ignition Control Circuit Group A (Cylinders 1,7,4,6)	P1359	This DTC detects when the circuit is open or shorted to +12V. -- Circuit check	Fault flag indicated	Ignition 1 is powered	Open - fault count = 5 out of 10 Short to +12V - fault count = 5 out of 10 frequency: 250 ms cont. Note : open detection is only performed at key-on with PCM in reset state.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Ignition Control Circuit Group B (cylinders 2,3,5,8)	P1360	This DTC detects when the circuit is open or shorted to +12V. -- Circuit check	Fault flag indicated	Ignition 1 is powered	Open - fault count = 5 out of 10 Short to +12V - fault count = 5 out of 10. frequency: 250 ms cont. Note : open detection is only performed at key-on with PCM in reset state.	Type B
Crank Sensor Circuits Performance	P1372	24X Signal This diagnostic determines if the signals for crank sensors A and/or B corrupted (ie excessive noise is present) resulting in an occasional re-synch	The number of loss of match occurences is $\geq$ 6 within 85 cylinder events.	PCM state = crank or run Decode mode = Angle based No cam faults present	Execute at low resolution interrupt	Type B
ABS Rough Road Malfunction	P1380	This diagnostic detects if the ABS controller is indicating a fault. When this occurs, misfire will STILL run.	ABS controller sends a message to PCM indicating that a failure has occurred in the ABS module	none	16 failures out of 20 samples	Type C (DTC sets when a P0300 is active)
ABS System Rough Road Detection Communication Fault	P1381	This diagnostic detects if the rough road information is no longer being received from the ABS module. When this occurs, misfire will STILL run.	Serial data messages are lost for 5 seconds	none	16 failures out of 20 samples	Type C (DTC sets when a P0300 is active)
EGR Valve Pintle Circuit	P1404	functional check	Pintle position $\geq$ 8% from learned closed position for 20 seconds increments the failure counter.	Ignition Voltage $\geq$ 11.7 volts EGR Valve commanded closed.	4 failures for 20 seconds (with pintle movement > 30% for 5 seconds opening time between tests) frequency: 250 ms cont./ position error every 12.5 ms. cont.	Type A

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
AIR System - Bank 1	P1415	***Passive***: Part 1 HO2S sensors indicate lean condition present during open loop operation. Verifies proper operation of AIR pump. Part 2 Monitors the transition from open loop to closed loop to verify O2 sensor activity indicating that the AIR pumps have turned off. ***Active:*** HO2S sensors indicate lean condition present when AIR pump is turned on during closed loop operation	***Passive:*** Part 1 HO2S sensor > approx. 740 mv during open loop operation 50% of the time. Part 2 HO2S sensor does not toggle above 740 mv at least 100 times in 25 seconds. ***Active:*** HO2S sensor > 31.25 mv for > 1.9 seconds or fuel integrator delta of.07when pump turned on during closed loop operation.	***General Enable:*** No MAF DTC's set No MAP DTC's set No IAT DTC's set No ECT DTC's set No TP sensor DTC's set No HO2S DTC's set No Injector DTC's set No Misfire DTC's set No CKP DTC's set No EGR DTC's set No Fuel Trim DTC's set No IAC DTC's set No AIR pump relay DTC's set No AIR Solenoid DTC's set No EVAP DTC's set 0°C < IAT < 60.5°C 0°C < ECT < 60.5°C Ignition voltage > 9.5V for a time > 10 seconds Engine Run Time > 3 seconds Airflow < 35 g/s Exhaust backpressure < 79.9% A/F Ratio > 12.1:1 ∆TPS < 9.9% MAP > 50.5 kpa PE, COT, DFCO Not Active **Passive Part 1** Air Pumps = on A/F State = Open Loop **Passive Part 2** Air Pumps = off A/F State = Closed Loop **Active** Passive Test = Fail or inconclusive A/F State = Closed Loop Fuel integrator > 0.95 & < 1.05 BLM cell is valid RPM > 600 RPM Engine Load < 79.9%	***Passive:*** During open loop operation. Once per trip. ***Active:*** 3 seconds Up to 3 times per trip if passive test fails or is inconclusive.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
AIR System - Bank 2	P1416	***Passive***: Part 1 HO2S sensors indicate lean condition present during open loop operation. Verifies proper operation of AIR pump. Part 2 Monitors the transition from open loop to closed loop to verify O2 sensor activity indicating that the AIR pumps have turned off. ***Active:*** HO2S sensors indicate lean condition present when AIR pump is turned on during closed loop operation	***Passive:*** Part 1 HO2S sensor > approx. 740 mv during open loop operation 50% of the time. Part 2 HO2S sensor does not toggle above 740 mv at least 100 times in 25 seconds. ***Active:*** HO2S sensor > 31.25 mv for > 1.9 seconds or fuel integrator delta of.07when pump turned on during closed loop operation.	***General Enable:*** No MAF DTC's set No MAP DTC's set No IAT DTC's set No ECT DTC's set No TP sensor DTC's set No HO2S DTC's set No Injector DTC's set No Misfire DTC's set No CKP DTC's set No EGR DTC's set No Fuel Trim DTC's set No IAC DTC's set No AIR pump relay DTC's set No AIR Solenoid DTC's set No EVAP DTC's set 0°C < IAT < 60.5°C 0°C < ECT < 60.5°C Ignition voltage > 9.5V for a time > 10 seconds Engine Run Time > 3 seconds Airflow < 35 g/s Exhaust backpressure < 79.9% A/F Ratio > 12.1:1 ∆TPS < 9.9% MAP > 50.5 kpa PE, COT, DFCO Not Active **Passive Part 1** Air Pumps = on A/F State = Open Loop **Passive Part 2** Air Pumps = off A/F State = Closed Loop **Active** Passive Test = Fail or inconclusive A/F State = Closed Loop Fuel integrator > 0.95 & < 1.05 BLM cell is valid RPM > 600 RPM Engine Load < 79.9%	***Passive:*** During open loop operation. Once per trip. ***Active:*** 3 seconds Up to 3 times per trip if passive test fails or is inconclusive.	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Evap. Emission Control System - Continuous Open Purge Flow	P1441	This DTC will determine if the purge solenoid is leaking to engine manifold vacuum.	Tank Vacuum > 7" H2O for 3 seconds before purge time > 30 sec (Eldorado Tank Vacuum > 7" H2O for 3 seconds before purge time > 45 sec)	No IAT DTC's active No MAP DTC's active No TP sensor DTC's active No O2 sensor DTC's active No VS sensor DTC's active No ECT sensor DTC's active DTC P0125 not active 15 % < Fuel Level < 85 % 10 V < System Voltage < 18 V 4 °C < IAT < 30 °C Engine Coolant Temp < 32.20313 °C Baro > 72.5 kPa (8000 ft)	Once per trip. Max time is 30 sec (Eldorado Max time is 45 sec)	Type B
PCM EEPROM Performance	P1621	This DTC detects a hardware error in the PCM non-volatile memory areas.	All blocks of non-volatile memory storage are bad except for the one currently being used.	None	Immediate set. continuous	Type B
Internal Mode Switch Mode A Circuit Low	P1820	This DTC detects when the IMS mode A circuit reads low (0 volts) when it should be high.	Mode A has always been low in Park ≥ 2 sec and later in Transitional_1. Note: PRNDL code changes from D4 to Transitional_1 when Mode A is Low.	Engine Torque not defaulted 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8 V ≤ System Voltage ≤ 18 V 40 N-m ≤ Engine Torque ≤ 200 N-m	Fail count ≥ 1	Type B
Internal Mode Switch Mode B Circuit High	P1822	This DTC detects when the IMS Mode B circuit reads high (12 Volts) when it should read low.	Mode B has always been high in Park ≥ 2 sec. and later in Transitional_13. Note: PRNDL code changes from D4 to Transitional_13 when Mode B is High.	Engine Torque not defaulted 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8 V ≤ System Voltage ≤ 18 V 40 N-m ≤ Engine Torque ≤ 200 N-m	Fail count ≥ 1	Type B
Internal Mode Switch Mode P Circuit Low	P1823	This DTC detects when the IMS Mode P circuit reads low (0 volts) when it should read high.	Mode P has always been low in Park > 2 sec and later in Transitional_8 Note: PRNDL code changes from D4 to Transitional_8 when Mode P is Low.	Engine Torque not defaulted 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8 V ≤ System Voltage ≤ 18 V 40 N-m ≤ Engine Torque ≤ 200 N-m	Fail count ≥ 1	Type B
Shift Solenoid A Control Circuit - Low Voltage	P1842	This DTC detects a continuous open or short to ground in SSA ckt/sensor	Shift Solenoid A is commanded ON AND (Open flag = 1 OR Short to ground flag = 1)	450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8 V ≤ System Voltage ≤ 18 V	43 fails out of 50 samples	Type B
Shift Solenoid A Control Circuit - High Voltage	P1843	This DTC detects a continuous short to +12 volts in SSA ckt/sensor	Shift Solenoid A fail mode = 1	Shift Solenoid A commanded on. 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8 V ≤ System Voltage ≤ 18 V	43 fails out of 50 samples	Type B
Shift Solenoid B Control Circuit - Low Voltage	P1845	This DTC detects a continuous open or short to ground in SSB ckt/sensor	Shift Solenoid B is commanded ON AND (Open flag = 1 OR Short to ground flag = 1)	450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8 V ≤ System Voltage ≤ 18 V	43 fails out of 50 samples	Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Shift Solenoid B Control Circuit - High Voltage	P1847	This DTC detects a continuous short to +12 volts in SSB ckt/sensor	Shift Solenoid B fail mode = 1	Shift Solenoid B commanded on. 450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8 V ≤ System Voltage ≤ 18 V	43 fails out of 50 samples	Type B
Torque Converter Clutch PWM Solenoid Control Circuit	P1860	This DTC detects a continuous open or short to ground in TCC PWM ckt/sensor	TCC failure mode = 1	450 ≤ Engine RPM ≤ 7500 ≥ 5 sec. & not in Fuel Cut-off 8 V ≤ System Voltage ≤ 18 V TCC Solenoid DC ≤ 10% or ≥ 90%	43 fails out of 50 samples	Type B