2000 Car V6 group 2 3.1L (LG8), 3.4L (LA1), 3.8L (L36), 3.8L supercharged (L67)
ENGINE DIAGNOSTIC PARAMETERS

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
MAF Sensor Range/Perf	P0101	0 to 231gps 1500HZ to 10500HZ	Delta of 25-35 gps between the actual airflow and calculated airflow	Delta TPS < 1.5% EGR < 50% 9V < ign voltage < 18 V Engine stable = 2 sec Engine vacuum < 80.00 kpa Purge duty cycle < 100.00 %	#395 test failures out of 400 tests	DTC Type B
MAF Sensor Circuit Low Input	P0102	0 to 231gps 1500HZ to 10500HZ	Frequency value < 1200 HZ	RPM > 50 Ign voltage > 8 V Conditions stable > 0.5 sec TPS < 60 % IAC steps > 5	395 test failures out of 400 tests	DTC Type B
MAF Sensor Circuit High Input	P0103	0 to 231gps 1500HZ to 10500HZ	Frequency value> 11500 HZ	RPM > 50 Ign voltage > 8 V Conditions stable > 0.5 sec TPS < 60 % IAC steps > 5	395 test failures out of 400 tests	DTC Type B
MAP Sensor Circuit - Low Input	P0107	This DTC detects a continuous short to low or open in either the signal circuit or the MAP sensor.	Raw MAP < 2 %	No TP sensor DTC's set Engine Running Throttle Position is ≥ 10 % when Engine speed is > 1000 RPM	175 test failures within a 200 test sample. 12.5ms loop Continuous	DTC Type B
MAP Sensor Circuit - High Input	P0108	This DTC detects a continuous short to high in either the signal circuit or the MAP sensor.	Raw MAP > 84%	No TP sensor DTC's set Engine Running Throttle Position ≤ 2% when Engine speed is ≤ 900 RPM	175 test failures within a 200 test sample. 12.5ms loop Continuous	DTC Type B
Intake Air Temp. Sensor Circuit -Low Input	P0112	The DTC detects a continuous short to ground in the IAT signal circuit or the IAT sensor	Raw IAT < 7.00 counts (135 °C)	No VS sensor DTCs set. No ECT sensor DTCs set Vehicle speed ≥ 25.00 mph Engine run time > 10.00 seconds	175.00 test failures within a 1200.00 test sample Continuous	DTC Type B
Intake Air Temp. Sensor Circuit - High Input	P0113	The DTC detects a continuous open or short to high in the IAT signal circuit or the IAT sensor	Raw IAT > 254.00 counts (-38 °C)	No ECT sensor DTC's set No VS sensor DTC's set Vehicle speed < 5.00 mph Air flow < 8.00 g /second Coolant > 60.00 °C Engine run time> 180.00 seconds	1100.00 test failures within a 1200.00 test sample Continuous	DTC Type B
Engine Coolant Temperature Circuit Low Input	P0117	Thermister Analog Voltage This DTC detects if the engine coolant sensor's analog voltage falls below a minimum expected value	Raw ECT < 37.00 counts (140°C)	Engine run time > 3.00 seconds	240.00 test failures within a 250.00 test sample Continuous	DTC Type B

2000 Car V6 group 2 3.1L (LG8), 3.4L (LA1), 3.8L (L36), 3.8L supercharged (L67)
ENGINE DIAGNOSTIC PARAMETERS

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 Coolant Temperature Circuit High Input	P0118	Thermister Analog Voltage The DTC detects if the engine coolant sensor's analog voltage exceeds a maximum expected value	RawECT > 247.00 counts (-40°C)	Engine run time > 15.00 seconds	240.00 test failures within a 250.00 test sample Continuous	DTC Type B
Throttle Position Sensor Circuit Range/Rationality	P0121	The DTC detects a "skewed" or stuck TP sensor	The last throttle position value > or < predicted throttle position. Lookup table for stuck high or low based on engine RPM.	No TP sensor DTC's set or failures flagged No MAP sensor DTC's set Engine Running MAP < 50 kpa (stuck high) MAP > 70 kpa (stuck low) TP sensor Δ < 4 % IAC position between 0.00 - 130.00 counts	95 test failures within 100 test sample Continuous	DTC Type B
Throttle Position Sensor Circuit-Low Input	P0122	This DTC detects a continuous short to low or open in either the signal circuit or the TP sensor.	Raw TP sensor signal < 2%	Engine running	95 consecutive test failures within a 100 test sample Continuous	DTC Type B
Throttle Position Sensor Circuit-High Input	P0123	This DTC detects a continuous short to high in either the signal circuit or the TP sensor.	Raw TP sensor signal > 98 %	Engine running	95 consecutive test failures within a 100 test sample Continuous	DTC Type B
Insufficient Coolant Temperature for Closed Loop Fuel Control	P0125	Thermistor Analog Voltage This DTC detects if a stabilized minimum closed-loop coolant temperature is reached and maintained after engine start-up	If closed-loop timer is exceeded: 6.00 sec @ 50 °F 154.00 sec @ 20 °F 287.00 sec @ region 3 ECT < -10.00 °C	ECT sensor shorts test not failing ECT DTCs not active IAT sensor DTCs not active Start up ECT $\leq$ 40.00 °C IAT $\geq$ -6.99 °C ECT $\geq$ -40.00 °C Max Idle Time $\leq$: 5.00 sec @ 50 °F 120.00 sec @ 20 °F 225.00 sec @ Reg 3 Min Total Engine Air $\geq$: 676.00 grams @ 50 °F 2068.00 grams @ 20 °F 3438.00 grams @ Reg 3	80.00 consecutive test failures (i.e. test failures * loop rate = sec) 100ms loop Continuous	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
O2S 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 PE.	O2 sensor voltage < 175.01 millivolts or O2 sensor voltage < 599.99 millivolts in PE mode	No misfire DTC's No crank 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Closed loop Air/Fuel ratio ≥ 14.50 but ≤ 14.80 Throttle position > 3.01 % but < 40.00 %	90 test failures in a 100.00 test sample for 5.00 sets of samples 550.00 failures in a 600.00 test sample for PE mode	DTC Type B
O2S 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 DFCO	O2 sensor voltage > 975.00 millivolts or O2 sensor voltage > 110.00 millivolts in DFCO mode	No misfire DTC's No crank sensor 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Closed loop Air/Fuel ratio ≥ 14.50 but ≤ 14.80 Throttle position > 3.01 % but < 40.00 %	90.00 test failures in a 100.00 test sample for 5.00 sets of samples. 290.00 failures in a 300.00 test sample for DFCO mode	DTC Type B
O2S 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 > 139.84 msec R/L > 107.03 msec	No misfire DTC's No crank sensor 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Coolant temp > 50.00 C 1000.00 < RPM < 3000.00 13.00 gps < MAF < 30.00 gps Canister purge duty cycle > 24 %	60.00 seconds after closed loop enable Once per key cycle	DTC Type B

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O2S Circuit-No Activity Detected (Bank 1,Sensor 1)	P0134	This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open.	O2 sensor > 400.00 millivolts but < 499.99 millivolts	No misfire DTC's No crank sensor 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Engine run time > 200.00 seconds	290.00 test failures in a 300.00 test sample Continuous	DTC Type B
O2S Heater Circuit Malfunction (Bank 1, Sensor 1)	P0135	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 mean O2 bias voltage. *Time based on table: Time vs Start Up Coolant Temp.	No misfire DTC's No crank sensor 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's ECT < 35.00 °C IAT < 35.00 °C ∆ ECT-IAT ≤ 6.02 °C Avg MAF < 18.00 gps 9.00 < System Voltage < 18.00 Avg Bias	From cold start to a run time maximum of 100 seconds. *Time determined by table.	DTC Type B
O2S 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 PE.	O2 sensor voltage < 10.00 millivolts or O2 sensor voltage < 599.99 millivolts in PE mode	No misfire DTC's No crank sensor 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Closed loop Air/Fuel ratio ≥ 14.50 but ≤ 14.80 Throttle position > 3.01 % but < 40.00 %	560.00 test failures in a 600.00 test sample for 4.00 sets of samples 900.00 failures in a 1000.00 test sample for PE mode	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
O2S 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 DFCO	O2 sensor voltage > 999.99 millivolts or O2 sensor voltage > 200.00 millivolts in DFCO mode	No misfire DTC's No crank sensor 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Closed loop Air/Fuel ratio $\geq$ 14.50 but $\leq$ 14.80 Throttle position > 3.01 % but < 40.00 %	560.00 test failures in a 600.00 test sample for 600 sets of samples. 900.00 failures in a 1000.00 test sample for DFCO mode	DTC Type B
O2S Circuit-No Activity Detected (Bank 1,Sensor 2)	P0140	This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open.	O2 sensor > 424.99 millivolts but < 475.00 millivolts	No misfire DTC's No crank sensor 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Engine run time > 200.00 seconds	900.00 test failures in a 1000.00 test sample Continuous	DTC Type B
O2S Heater Circuit Malfunction (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 $\pm$ .150 millivolts from the mean O2 bias voltage. *Time based on table: Time vs Start Up Coolant Temp.	No misfire DTC's No crank sensor 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's ECT < 35.00 °C IAT < 35.00 °C Δ ECT-IAT $\leq$ 6.02 °C Avg MAF < 24.00 gps 9.00 < System Voltage < 18.00 Avg Bias	From cold start to a maximum time of 450 seconds. *Time determined by table.	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
System Too Lean (Bank 1)	P0171	Determines if the system is in a lean condition.	The average of short term fuel trim samples ≥ 1.08 and The average of adaptive index multiplier samples ≥ 1.16	The following DTC's are not set: VSS DTCs EST DTCs Crank sensor DTCs CAM sensor DTCs TPS DTC's Misfire DTC's IAC DTC's Injector DTC's MAF DTC's O2 sensor DTC's MAP DTC's EGR DTC's Evap. DTC's ECT DTC's IAT DTC's Throttle position < 90.00 % Engine speed > 600.00 rpm but < 4000.00 rpm Baro > 70.00 kpa (8500 ft) ECT > 20.00 °C but < 110.00 °C MAP > 15.00 kpa but < 85.00 kpa IAT > -18.01 °C but < 70.00 °C Air flow > 3.00 g/s < 150.00 g/s Vehicle speed < 82.00 mph	If lean counter is ≥5.00 tests Continuous	DTC Type B
System Too Rich (Bank 1)	P0172	Determines if the system is in a rich condition.	The average of short term fuel trim samples ≤ 0.97 and The average of adaptive index multiplier samples ≤ 0.83	The following DTC's are not set: VSS DTCs EST DTCs Crank sensor DTCs CAM sensor DTCs TPS DTC's Misfire DTC's IAC DTC's Injector DTC's MAF DTC's O2 sensor DTC's MAP DTC's EGR DTC's Evap. DTC's ECT DTC's IAT DTC's Throttle position < 90.00 % Engine speed > 600.00 rpm but < 4000.00 rpm Baro > 70.00 kpa (8500 ft) ECT > 20.00 °C but < 110.00 °C MAP > 15.00 kpa but < 85.00 kpa IAT > -18.01 °C but < 70.00 °C Air flow > 3.00 g/s < 150.00 g/s Vehicle speed < 82.00 mph	If lean counter is ≥5.00 tests Continuous	DTC Type B

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ENGINE DIAGNOSTIC PARAMETERS

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
Injector Circuit Fault - Cylinder 1	P0201	This DTC checks the injectors for electrical integrity	Output state is invalid	PCM state = run	30.00 seconds 1 second loop Continuous	DTC Type B
Injector Circuit Fault - Cylinder 2	P0202	This DTC checks the injectors for electrical integrity	Output state is invalid	PCM state = run	30.00 seconds 1 second loop Continuous	DTC Type B
Injector Circuit Fault - Cylinder 3	P0203	This DTC checks the injectors for electrical integrity	Output state is invalid	PCM state = run	30.00 seconds 1 second loop Continuous	DTC Type B
Injector Circuit Fault - Cylinder 4	P0204	This DTC checks the injectors for electrical integrity	Output state is invalid	PCM state = run	30.00 seconds 1 second loop Continuous	DTC Type B
Injector Circuit Fault - Cylinder 5	P0205	This DTC checks the injectors for electrical integrity	Output state is invalid	PCM state = run	30.00 seconds 1 second loop Continuous	DTC Type B
Injector Circuit Fault - Cylinder 6	P0206	This DTC checks the injectors for electrical integrity	Output state is invalid	PCM state = run	30.00 seconds 1 second loop Continuous	DTC Type B
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	P0300 P0301 P0302 P0303 P0304 P0305 P0306	These DTC 's will determine if a random misfire or a cylinder specific misfire is occurring by monitoring crankshaft velocity.	Deceleration index vs Engine Speed vs Load and Camshaft Position	Engine run time > 0-5 sec depending on start up RPM No VSS DTC's No crank sensor DTC's No TP sensor DTC's No MAP sensor DTC's No ECT sensor DTC's No CAM sensor DTCs No mass airflow sensor DTCs Fuel cutoff not active Brake torque management not active Fuel level > 10% ECT > -6.02 °C but < 120.00 ° C Engine speed > 550.00 RPM but < 5850.00 RPM System voltage > 9.00 volts but < 18.00 volts + Throttle position Δ < 6.25 % / 100ms - Throttle position Δ < 1.56 %/100ms Rough Road- Ratio of consecutive positive peak delta ref times to nonconsecutive peaks.	10 failed 200 revolution blocks out of 16 Emission Level 4 failed 200 revolution block s of catalyst damaging level on FTP AND 1 failed 200 revolution bocks of catalyst damaging level on off FTP Continuous	DTC Type B *EMISSION* DTC Type A CATALYST DAMAGING

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
Knock Sensor Circuit Fault	P0325	This diagnostic will detect a failed internal PCM component associated with knock control	Output voltage is high and stays relatively constant	Enable Conditons No vehicle speed sensor DTCs set No throttle position sensor DTCs set No coolant temperature sensor DTCs set No CAM sensor DTCs set No crank sensor DTCs set No MAF sensor DTCs set Engine running longer than 30 seconds Ignition voltage > 8 volts Throttle position > 10.00 % Coolant temperature > 80.00 °C Engine speed between 1000 & 2500 RPM Cylinder air mass > 40.00 % Spark retard < 20.10 degrees Determine Fault Region Average voltage > 4.80 volts	Every combustion event Continuous 260 test failures out of 300 samples	DTC Type B
Knock Sensor 1 Input Fault	P0327	This diagnostic will detect a wiring fault with knock sensor 1	Output voltage amplitude is low and stays relatively constant	Enable Conditons No vehicle speed sensor DTCs set No throttle position sensor DTCs set No coolant temperature sensor DTCs set No CAM sensor DTCs set No crank sensor DTCs set No MAF sensor DTCs set Engine running longer than 30 seconds Ignition voltage > 8 volts Throttle position > 10.00 % Coolant temperature > 80.00 °C Engine speed between 1000 & 2500 RPM Cylinder air mass > 40.00 % Spark retard < 20.10 degrees Determine Fault Region Instantaneous voltage - average voltage is too small; delta from average < 0.039 V	Every combustion event Continuous 260 test failures out of 300 samples	DTC Type B

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Knock Sensor 2 Input Fault	P0332	This diagnostic will detect a wiring fault with knock sensor 2	Output voltage amplitude is low ans stays relatively constant	Enable Conditons No vehicle speed sensor DTCs set No throttle position sensor DTCs set No coolant temperature sensor DTCs set No CAM sensor DTCs set No crank sensor DTCs set No MAF sensor DTCs set Engine running longer than #dg_Engine running longer than 30 seconds Ignition voltage > 8 volts Throttle position > 10.00 % Coolant temperature > 80.00 °C Engine speed between 1000 & 2500 RPM Cylinder air mass > 40.00 % Spark retard < 20.10 degrees Determine Fault Region Instantaneous voltage - average voltage is too small; delta from average < 0.039 V	Every combustion event Continuous 260 test failures out of 300 samples	DTC Type B
Crankshaft Position Sensor Circuit-Range/Perf	P0336	24X Signal This diagnostic will detect an incorrect signal from the crankshaft sensor.	If in one engine cycle 48 med. res. pulses are not seen	Engine run time > 3.00 sec 3X crank signal	290.00 ref pulse failures within 300.00 sample limit. Continuous	DTC Type B
Camshaft Position Sensor Circuit Range/Perf	P0341	1X Signal This diagnostic will detect if the Cam Sensor signal is present.	Engine Running Cam Sensor reference pulse is not seen once every 6 cylinder events..	----------	If Cam signal is not detected 290.00 out of 300.00 test samples. Continuous	DTC Type B

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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 Δ is monitored over a period of time. This value is compared with a threshold from 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 injector DTCs set No crank DTCs set No TP sensor DTC's set No MAP DTC's set No VS sensor DTC's set No IAT sensor DTC's set No ECT sensor DTC's set No IAC DTC's set No Linear EGR Pintle Position DTC set No Misfire DTC's set No MAF DTC's set MAP Δ < 1.50 kpa RPM Δ < 400 MPH Δ < 5.00 ECT > 75.00 ° C Baro > 70.00 kpa (??? ft) Vehicle Speed > 28.00 mph IAC Δ < 5.00 counts AC clutch status is unchanged Transmission status is unchanged ***Start Test*** Throttle Position < 1% EGR Position < 1% Engine Speed > 1050.00 rpm but < 1400.00 rpm MAP Δ < 1.50 kpa MAP > 10.00 kpa but < 50.00 kpa ***Run Test*** Stabilized MAP (valve closed) recorded and EGR valve "ramped" open over a time interval and peak MAP value recorded and MAP Δ computed. EGR valve "ramped" closed over a time interval.	1 second Once per trip	DTC Type A
Exhaust Gas Recirculation - Insufficient Flow Detected	P0401 (cont.)	This diagnostic will determine if there is a reduction in EGR flow.	With EGR valve open, the peak + MAP Δ is monitored over a period of time. This value is compared with a threshold from 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.	***Rapid Step Response Test*** IF the difference between the current EWMA and the current map diff > 5.50 kpa AND current map diff > 2.00 kpa THEN 5.00 tests will be run per trip until 30.00 tests have been met	1 second Once per trip	DTC Type A
Linear EGR Circuit Fault	P0403	This DTC checks the Linear EGR circuit for electrical integrity	Output state invalid	PCM state = crank or run	20.00 seconds 100ms loop Continuous	DTC Type B

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EGR Valve Circuit Performance	P0404	This diagnostic detects if the pintle position error is too large	Pintle position error [absolute value of (desired position - actual position)] > 15.00 %	Desired EGR position > 0% Code P0401 status = not in progress EGR valve icing or over temperature not occurring Maximum Δ Desired EGR position < 30.00 % Ignition voltage ≥ 10.00 volts	200.00 loops 100ms loop Continuous	DTC Type B
EGR Valve Position Sensor Circuit Low Voltage	P0405	This diagnostic detects if the pintle position feedback circuit is open or shorted to ground	EGR feedback sensor signal < 7.00 counts	EGR valve icing or over temperature not occurring Ignition voltage ≥ 10.00 volts	20.00 seconds 100ms loop Continuous	DTC Type B
Catalyst Low Efficiency Bank 1	P0420	Oxygen Storage	OSC time difference ≥ 0.069 OSC time difference = OSC worst pass threshold - OSC compensation factor * (post cat O2 resp time - pre cat O2 resp time) OSC worst pass thresh = 1.2375	No EST DTC's set No EGR DTC's set No MAT DTC's set No IAC DTC's set No injector DTC's set No VS sensor DTC's set No TP sensor DTC's set No O2 sensor DTC's set No Misfire DTC's set No MAP sensor DTC's set No Fuel Trim DTC's set No ECT sensor DTC's set ***Valid Idle Period Criteria*** Engine speed ≥ 900.00 RPM for a minimum of 600.00 sec since end of last idle period. Min engine run time for stable BLM ***Test Enable Conditions*** Predicted catalyst temperature ≥ 450.00 Closed loop fuel control Barometric pressure ≥ 75.00 kpa -20.00 ≤ IAT ≤ 100.00 °C 75.00 ≤ ECT ≤ 123.98 °C 0 < Idle period ≤ 60.00 seconds Tests attempted this trip ≤ 6.00 Delta engine speed ≤ 123 ***Rapid Step Response Enable Criteria*** OSC time difference step ≥ 0.4 sec OSC time difference ≥ 0.00 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 continuous	DTC Type A

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Evap. Emission Control System - Malfunction	P0440	This diagnostic will detect a missing gas cap or a “gross” leak in the evap system.	Evap leak > 0.080”	No MAT DTC's set No MAP DTC's set No TP sensor DTC's set No Air flow DTC’s set No O2 DTC’s set No VSS DTC’s set No Misfire DTC’s set No Fuel Trim/Fuel Injector DTC’s set No EGR DTC’s set No Coolant DTC’s set No AIR DTC’s set ∆fuel level in 100ms < 1.4 - 2.7 % ∆tank pressure in 100ms < 0.44 - 1.8“ H2O Cold fuel tank timer < 300 sec Baro > 75.20 kPa (8000 ft) 4.41 ° ≤ Powerup ECT ≤ 30.00 °C 4.41 ° ≤ Powerup IAT ≤ 30.00 °C ECT-IAT no more than 8.01 °C IAT-ECT no more than 1.99) °C 15.00 % < Fuel Level < 85.10 % 5.00 V < System Voltage < 18.00 V	Test runs once per cold trip if all conditions are met. Test begins at 180s after start and ends when tank vacuum reaches 7.9” H2O or timer expires (37.5s).	DTC Type B
Evap. Emission System Leak Detection	P0442	This diagnostic will detect a small leak in the evap system. Test begins after “gross” leak test and monitors the vacuum decay in the system. If vacuum decay slope exceeds threshold, system monitors for fuel vapor generation	Evap system leak between 0.040” and 0.080”	No MAT DTC's set No MAP DTC's set No TP sensor DTC's set No Air flow DTC’s set No O2 DTC’s set No VSS DTC’s set No Misfire DTC’s set No Fuel Trim/Fuel Injector DTC’s set No EGR DTC’s set No Coolant DTC’s set No AIR DTC’s set ∆fuel level in 100ms < 1.4 - 2.7 % ∆tank pressure in 100ms < 0.44 - 1.8“ H2O Cold fuel tank timer < 300 sec Baro > 75.20 kPa (8000 ft) 4.41 ° ≤ Powerup ECT ≤ 30.00 °C 4.41 ° ≤ Powerup IAT ≤ 30.00 °C ECT-IAT no more than 8.01 °C IAT-ECT no more than 1.99) °C 15.00 % < Fuel Level < 85.10 % 5.00 V < System Voltage < 18.00 V	Test runs once per cold trip if all conditions are met. Test begins after “gross” leak test and monitors the vacuum decay in the system. If vacuum decay slope is too great, system monitors for fuel vapor generation.	DTC Type B
Canister Purge Circuit Fault	P0443	This DTC checks the output driver for electrical integrity	Output state invalid	PCM state = crank or run	30 sec Continuous	DTC Type B

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ENGINE DIAGNOSTIC PARAMETERS

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 - Air Vent Circuit Fault	P0446	This diagnostic will detect a blockage in the evap system which would keep the system from venting. Test begins after small leak test and monitors tank vacuum for a period of time.	Tank Vacuum > 10" H2O	No MAT DTC's set No MAP DTC's set No TP sensor DTC's set No Air flow DTC's set No O2 DTC's set No VSS DTC's set No Misfire DTC's set No Fuel Trim/Fuel Injector DTC's set No EGR DTC's set No Coolant DTC's set No AIR DTC's set Baro > 75.20 kPa (8000 ft) ∆fuel level in 100ms < 1.4 - 2.7 % ∆tank pressure in 100ms < 0.44 - 1.8" H2O Cold fuel tank timer < 300 sec 4.41 ° ≤ Powerup ECT ≤ 30.00 °C 4.41 ° ≤ Powerup IAT ≤ 30.00 °C ECT-IAT no more than 8.01 °C IAT-ECT no more than 1.99) °C 15.00 % < Fuel Level < 85.10 % 5.00 V < System Voltage < 18.00 V	Test runs once per cold trip if all conditions are met. Test begins after small leak test and monitors tank vacuum for a period of time. If tank vacuum exceeds 10" H2O (11" H2O in H-car) for 4 seconds, test fails.	DTC Type B
Fuel Tank Vent Circuit Fault	P0449	This DTC checks the output driver for electrical integrity	Output state invalid	PCM state = crank or run	30 sec Continuous	DTC Type B
Evap. Emission Control System - Fuel Tank Pressure Sensor Circuit Low	P0452	This diagnostic will detect a fuel tank pressure sensor short circuit.	Fuel tank Pressure sensor	Evap diagnostic is enabled	Fails if tank pressure sensor signal fails low for 5 consecutive seconds. Continuous	DTC Type B
Evap. Emission Control System - Fuel Tank Pressure Sensor Circuit High	P0453	This diagnostic will detect a fuel tank pressure sensor open ...	Fuel tank Pressure sensor	Evap diagnostic is enabled	Fails if tank pressure sensor signal fails high for 5 consecutive seconds. Continuous	DTC Type B
Fuel Level Sensor Circuit Low Input	P0462 (pull ahead models have no DTC)	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 < 28 % OR ClassII/UART: Communication between the cluster and PCM is lost Default to gauge: 0.00 % Default to evap and misfire: 40%	12.5 ms Continuous Failed for #f_tank.ke_flv_low_fuel_lvl_invalid_time consecutive seconds	DTC Type C

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 Level Sensor Circuit High Input	P0463 (pull ahead models have no DTC)	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 > 134 % 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 60.00 consecutive seconds	DTC Type C
Fan 1 Relay Circuit Fault	P0480	This DTC checks the output driver for electrical integrity	Output state invalid	PCM state = crank or run	30 sec Continuous	DTC Type B
Fan 2 Relay Circuit Fault	P0481	This DTC checks the output driver for electrical integrity	Output state invalid	PCM state = crank or run	30 sec Continuous	DTC Type B
Idle Control System RPM Lower Than Expected	P0506	This DTC will determine if a low idle is the result of a IAC valve or circuit. A low idle is defined as 175 RPM below the desired idle. (Desired RPM range 725 to 800)	RPM < (Desired RPM - 100)	***Test Enable:*** No CCP DTC's set No misfire DTC's set No EGR DTC's set No TP sensor DTC's set No VS sensor DTC's set No ECT DTC's set No MAP DTC's set No IAT DTCs set No Fuel Trim DTC's set No Injector DTCs set No Crank sensor DTCs set No MAF DTC's set ECT > 70.00 °C System Voltage > 9.00 V but < 18.00 V IAT > -18.01 °C Engine run time > 120.00 seconds Baro > 65.00 kPa (12000 ft) TP < 1.31 % VS < 3.00 MPH Above met for a time > 15.00 seconds to enable diagnostic.	15.00 seconds Continuos after enable	DTC Type B

2000 Car V6 group 2 3.1L (LG8), 3.4L (LA1), 3.8L (L36), 3.8L supercharged (L67)
ENGINE DIAGNOSTIC PARAMETERS

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 Control System RPM Higher Than Expected	P0507	This DTC will determine if a high idle is the result of a IAC valve or circuit. A high idle is defined as 275 RPM above the desired idle. (Desired RPM range 725 to 800)	RPM > (Desired RPM + 175)	***Test Enable:*** No CCP DTC's set No misfire DTC's set No EGR DTC's set No TP sensor DTC's set No VS sensor DTC's set No ECT DTC's set No MAP DTC's set No IAT DTCs set No Fuel Trim DTC's set No Injector DTCs set No Crank sensor DTCs set No MAF DTC's set ECT > 70.00 °C System Voltage > 9.00 V but < 18.00 V IAT > -18.01 °C Engine run time > 120.00 seconds Baro > 65.00 kPa (12000 ft) TP < 1.31 % VS < 3.00 MPH Above met for a time > 15.00 seconds to enable diagnostic.	15.00 seconds Continuos after enable	DTC Type B
Check Sum Error	P0601	This DTC will be stored if the calibration check sum is incorrect	Output state invalid	PCM state = crank or run	Within 2 seconds at Powerup; background checksum after power up 50 ms loop Continuous	DTC Type A
PCM Programming Error	P0602	This DTC will be stored if the PCM has been replaced and has not been programmed	Output state invalid	PCM state = crank	Test is run at Powerup 100ms loop Continuous	DTC Type A
Fuel Level Sensor Circuit Fault	P0656	This diagnostic will detect a electrical fault of the fuel level sensor	Output state invalid	PCM state = run or crank	30 sec Continuous	DTC Type B
O2 Sys. Fault - Too Few O2S R/L or L/R Switches, Insufficient Activity (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 100.00 seconds: L/R switches < 40.00 R/L switches < 40.00 O2 voltage between 300.00 millivolts and 599.99 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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's DTC P0135 (O2 Heater) not set Closed loop	100.00 seconds after closed loop enable Once per key cycle	DTC Type B

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ENGINE DIAGNOSTIC PARAMETERS

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
O2S Incorrect 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 > 4.50 or < 0.50 O2 voltage between 300.00 V and 599.99 V	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 Fuel trim DTC's No EGR DTC's No ECT sensor DTC's DTC P0135 (O2 Heater) not set Closed loop	100.00 seconds after closed loop enable Once per key cycle	DTC Type B
Crank Angle Sensor Learned Error	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	DTC type A
EST Open Circuit Fault	P1351	This DTC checks the EST circuit for electrical integrity	Voltage state invalid	PCM state = crank or run	290.00 failures within 300.00 Every engine cycle Continuous	DTC Type B
EST Short Circuit Fault	P1352	This DTC checks the EST circuit for electrical integrity	Voltage state invalid	PCM state = crank or run	290.00 failures within 300.00 Every engine cycle Continuous	DTC Type B
Bypass Open Circuit Fault	P1361	This DTC checks the Bypass circuit for electrical integrity	Voltage state invalid	PCM state = crank or run	290.00 failures within 300.00 Every engine cycle Continuous	DTC Type B
Bypass Short Circuit Fault	P1362	This DTC checks the Bypass circuit for electrical integrity	Voltage state invalid	PCM state = crank or run	290.00 failures within 300.00 Every engine cycle Continuous	DTC Type B
Crank to Low Res Correlate	P1374	Pulsed 0V to 10V	3X signal 24X signal	Engine runtime > 3.00 sec Incorrect number of 3X signals per engine cycle	290.00 out of 300.00 test samples Continuous	DTC 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	50.00 failures out of 60.00 samples	DTC Type C (DTC sets when a P0300 is active)

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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 5.00 seconds	none	60.00 failures out of #di_misf_serial_data_sample_ cntr samples	DTC Type C (DTC sets when a P0300 is active)
EGR Valve Circuit Performance - Actual Position > Commanded Position	P1404	This diagnostic detects if the valve is stuck open when commanded closed.	Actual pintle position > 10.00 counts from closed position	EGR valve icing or over temperature not occurring Ignition voltage ≥ 10.00 volts	2.00 separate failures for 20.00 seconds (with pintle movement > 40.00 % for 0.50 seconds opening time between tests) 100ms loop Continuous	DTC Type B
Evap. Emission Control System Open Purge Flow	P1441	This diagnostic will detect a purge solenoid stuck open. Test begins after Vent Circuit test and monitors tank vacuum after the system is sealed.	Tank Vacuum > 11” H2O within 25 sec	No MAT DTC's set No MAP DTC's set No TP sensor DTC's set No Air flow DTC’s set No O2 DTC’s set No VSS DTC’s set No Misfire DTC’s set No Fuel Trim/Fuel Injector DTC’s set No EGR DTC’s set No Coolant DTC’s set No AIR DTC’s set Baro > 75.20 kPa (8000 ft) ∆fuel level in 100ms < 1.4 - 2.7 % ∆tank pressure in 100ms < 0.44 - 1.8“ H2O Cold fuel tank timer < 300 sec 4.41 ° ≤ Powerup ECT ≤ 30.00 °C 4.41 ° ≤ Powerup IAT ≤ 30.00 °C ECT-IAT no more than 8.01 °C IAT-ECT no more than 1.99) °C 15.00 % < Fuel Level < 85.10 % 5.00 V < System Voltage < 18.00 V	Test runs once per cold trip if all conditions are met	DTC Type B
V5BA Voltage Circuit Fault	P1635	5 Volts	Voltage state invalid	PCM state = run	10.00 sec 100ms loop Continuous	DTC Type B
V5BB Voltage Circuit Fault	P1639	5 Volts	Voltage state invalid	PCM state = run	10.00 sec 100ms loop Continuous	DTC Type B