2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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 gps between the actual airflow and calculated airflow *Delta based on table: Delta vs Calculated Airflow	• No TPS DTC's • No MAP DTC's • No MAF Circuit DTC's • No EVAP DTC's • No EGR DTC's • Engine Run Flag = Active • Traction Control = Not Active • EGR Flow Diagnostic = Not Active • EGR Position (or DC) < 100.00 % • 9.00 V < ign voltage < 18.00 V • Delta MAP < 3 kpa • Delta TPS < 1.50 % • TPS < 25.00 % • Engine stable = 5.00 sec • Engine vacuum < 63.01 kpa • Purge duty cycle < 100 %	395.00 test failures out of 400.00 tests	DTC Type A
MAF Sensor Circuit Low Input	P0102	0 to 231gps 1500HZ to 10500HZ	Frequency value < 1200.00 HZ	• RPM > 0.98 • Ign voltage > 8.00 V • Conditions stable > 0.50 sec • Engine Run Time > 0.00 sec • IAC steps > 2.00	395.00 test failures out of 400.00 tests	DTC Type A
MAF Sensor Circuit High Input	P0103	0 to 231gps 1500HZ to 10500HZ	Frequency value> 11500.00 HZ	• RPM > 0.98 • Ign voltage > 8.00 V • Conditions stable > 0.50 sec • Engine Run Time > 0.00 sec • IAC steps > 2.00	395.00 test failures out of 400.00 tests	DTC Type A
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 < 1.95 %	• No TP sensor DTC's set • Engine Running • Throttle Position ≥ 0.00 % when Engine speed is ≤ 1000.00 RPM **OR** • Throttle Position is ≥ 10.00 % when Engine speed is > 1000.00 RPM	175.00 test failures within a 200.00 test sample. Frequency: 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 > 86.21 %	• No TP sensor DTC's set • Engine Runtime > 1 sec >30 Deg C Coolant, 120 sec at –30 Deg C Coolant • Throttle Position < 1.99 % when Engine speed is ≤ 3000.00 RPM **OR** • Throttle Position is < 30.00 % when Engine speed is > 3000.00 RPM	175.00 test failures within a 200.00 test sample. Frequency: 12.5ms loop Continuous	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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
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 (123 °C)	• None of the following DTCs set: VS sensor ECT sensor • Vehicle speed ≥ 25.00 mph • Engine run time > 10.00 seconds	175.00 test failures within a 200.00 test sample Frequency: 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 (-39 °C)	• None of the following DTCs set: ECT sensor, VS sensor • Vehicle speed < 35.00 mph • Air flow < 12.00 g /second • Coolant > 60.00 °C • Engine run time> 180.00 seconds	175 test failures within a 200.00 test sample Frequency: 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 test failures within a 250.00 test sample Frequency: Continuous	DTC Type B
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 test failures within a 250.00 test sample Frequency: 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.	• None of the following DTCs set: TP sensor, MAP sensor, IAC • Engine Runtime > 120.00 sec • MAP < 50.00 kpa (stuck high) • MAP > 70.00 kpa (stuck low) • MAP Stable for > 5.00 sec • Coolant > 75.00 °C • IAC position between 0 - 130.00 counts	50 test failures within 500 test sample for a stuck high failure or 50 test failures within 500 test sample for a stuck low failure Frequency: Continuous	DTC Type A
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 < 1.95 %	• Engine running	95.00 consecutive test failures within a 100 test sample Frequency: Continuous	DTC Type A

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ENGINE DIAGNOSTIC PARAMETERS

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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 Input	P0123	This DTC detects a continuous short to high in either the signal circuit or the TP sensor.	Raw TP sensor signal > 98.01 %	• Engine running	95.00 consecutive test failures within a 100 test sample Frequency: Continuous	DTC Type A
Insufficient Coolant Temperature for Closed Loop Fuel Control	P0125	Thermister 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: 127.00 sec @ 50 °F 280.00 sec @ 20 °F 439.00 sec @ region 3 ECT < 21.99 °C	• ECT sensor shorts test not failing • ECT DTCs not active • IAT sensor DTCs not active • Start up ECT ≤ 50.00 °C • IAT ≥ -6.99 °C • ECT ≥ -40.00 °C • Max Idle Time ≤ : 95.00 sec @ 50 °F 210.00 sec @ 20 °F 329.00 sec @ Reg 3 • Min Total Engine Air ≥ : 1252.00 grams @ 50 °F 1908.00 grams @ 20 °F 4669.00 grams @ Reg 3		DTC Type B
Thermostat Engine Coolant Temperature Rationality	P0128	Detects if engine coolant temperature rises too slowly due to an ECT or cooling system fault	If actual accumulated air flow is > predicted air flow before engine coolant reaches 80.00 °C	• None of the following DTCs set: P0102 - MAF Sensor Circuit Low Frequency P0103 - MAF Sensor Circuit High Frequency P0112 - IAT Sensor Low Voltage P0113 - IAT Sensor High Voltage P0117 - ECT Sensor Circuit Low Voltage P0118 - ECT Sensor Circuit High Voltage P0500 - Manual Trans VSS Low (if appl.) P0502 - VSS Ckt Lo Input DTC (if applicable) P0503 - VSS Ckt Hi Input DTC (if applicable) • Start up ECT < 78.01 °C • Minimum Average flow > 15 g/sec • Minimum distance traveled > 1.00 miles • Minimum MPH > 15.00 mph • 120.00 sec < Engine Run Time < 1800.00 sec • IAT > -6.99 °C • ECT > -40 °C	30.00 failure to set DTC Frequency: Once per ignition cycle	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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 < 52.08 millivolts or O2 sensor voltage < 598.96 millivolts in PE mode	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9 volts < system voltage < 18.00 volts • Device control = Not Active Sp Specific Enable Criteria • 12.00 < A/F ratio < 16.50 • 5 % < throttle position < 40.00 % • Fuel state = closed loop • All fuel injectors = ON For PE Test • Fuel state = PE • Fuel cut-off = false • Indication that closed loop fueling is ready	90 test failures in a 100.00 test sample for 5.00 sets of samples 90.00 failures in a 100.00 test sample for PE mode Frequency: 0.10 sample/sec	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 > 976.56 millivolts or O2 sensor voltage > 199.65 millivolts in DFCO mode	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable Criteria • 12.00 < A/F ratio < 16.50 • 5.00 % < throttle position < 40.00 % • Fuel_State = Closed loop For DFCO Test • Fuel state = DFCO • Rich saturation counter = 0 (for post catalyst sensors only) • Indication that closed loop fueling is ready	90.00 test failures in a 100 test sample for 5.00 sets of samples 290.00 failures in a 300.00 test sample for PE mode Frequency: 0.10 sample/sec	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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-Slow Response (Bank 1, Sensor 1)	P0133	This DTC determines if the O2 sensor response time is degraded	LRA > 120.00 msec RLA > 175.00 msec	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable Criteria • Bank 1 Sensor1 circuit and heater DTCs (P0131, P0132, P0134, P0135) = False • Bank 2 Sensor1 circuit and heater DTCs (P0151, P0152, P0154, P0155) = False • Misfire DTC (P0300) = False • Coolant temp > 50.00 °C • Engine run time > 60.00 seconds • Canister purge duty cycle > 0.00 % • 12.00 gps < MAF < 29.00 gps • 1200.00 < RPM < 3000.00 • Throttle position > 1.99 % • Fuel state = closed loop	100000.00 milliseconds Frequency: Once per trip	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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-No Activity Detected (Bank 1,Sensor 1)	P0134	This DTC determines if the O2 sensor is open.	407.99 millivolts < O2 sensor < 512.15 millivolts	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific_Enable_Criteria • Engine run time > 200.00 seconds • O2 location warm • Fuel state = closed loop (for post catalyst sensors only) • No O2 sensor heater DTCs (for post catalyst sensors only)	290 test failures in a 300 test sample Frequency: Continuous for pre catalyst sensors Once/trip for post catalyst sensors	DTC Type B
O2S Heater Circuit Malfunction (Bank 1, Sensor 1)	P0135	This DTC determines if the O2 sensor heater is degraded.	The elapsed time to obtain ± 150 millivolts from the mean O2 bias voltage. *Time based on table: Time vs Start Up Coolant Temp.	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable_Criteria • Current start = cold start • 1106.77 mV< start-up bias voltage < 0.00 mV	One test/trip	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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 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 < 30.38 millivolts or O2 sensor voltage < 551.22 millivolts in PE mode	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active • Specific Enable Criteria • 12.0 < A/F ratio < 16.50 • 5.00 % < throttle position < 40.00 % • Fuel state = closed loop • All fuel injectors = ON For PE Test • Fuel state = PE • Fuel cut-off = false • Indication that closed loop fueling is ready	390.00 test failures in a 400.00 test sample for 5.00 sets of samples 90.00 failures in a 100.00 test sample for PE mode Frequency: 0.10 sample/sec	DTC Type B
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 > 998.26 millivolts or O2 sensor voltage > 199.65 millivolts in DFCO mode	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable Criteria • 12.00 < A/F ratio < 16.50 • 5 % < throttle position < 40.00 % • Fuel_State = Closed loop For DFCO Test • Fuel state = DFCO • Rich saturation counter = 0 (for post catalyst sensors only) • Indication that closed loop fueling is ready	560.00 test failures in a 600.00 test sample for 5.00 sets of samples 900.00 failures in a 1000.00 test sample for PE mode Frequency: 0.10 sample/sec	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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-No Activity Detected (Bank 1,Sensor 2)	P0140	This DTC determines if the O2 sensor is open.	412.33 millivolts < O2 sensor < 499.13 millivolts	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific_Enable_Criteria • Engine run time > 200 seconds • O2 location warm • Fuel state = closed loop (for post catalyst sensors only) • No O2 sensor heater DTCs (for post catalyst sensors only)	900 test failures in a 1000 test sample Frequency: Continuous for pre catalyst sensors Once/trip for post catalyst sensors	DTC Type B
O2S Heater Circuit Malfunction (Bank 1, Sensor 2)	P0141	This DTC determines if the O2 sensor heater is degraded.	The elapsed time to obtain ± 150 millivolts from the mean O2 bias voltage. *Time based on table: Time vs Start Up Coolant Temp.	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable_Criteria • Current start = cold start • 399.31 mV< start-up bias voltage < 499.13 mV	One test/trip	DTC Type B

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ENGINE DIAGNOSTIC PARAMETERS

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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 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 PE.	O2 sensor voltage < 0.0 millivolts or O2 sensor voltage < 0.0 millivolts in PE mode	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Sp Specific Enable Criteria • 12.0 < A/F ratio < 16.50 • 0.00 % < throttle position < 0.00 % • Fuel state = closed loop • All fuel injectors = ON For PE Test • Fuel state = PE • Fuel cut-off = false • Indication that closed loop fueling is ready	0.00 test failures in a 0.00 test sample for 0.00 sets of samples 0.00 failures in a 0.00 test sample for PE mode Frequency: 0.10 sample/sec	DTC Type B
O2S 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 DFCO	O2 sensor voltage > 0 millivolts or O2 sensor voltage > 0 millivolts in DFCO mode	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable Criteria • 12.00 < A/F ratio < 16.50 • 0.00 % < throttle position < 0.00 % • Fuel_State = Closed loop For DFCO Test • Fuel state = DFCO • Rich saturation counter = 0 (for post catalyst sensors only) • Indication that closed loop fueling is ready	0.00 test failures in a 0.00 test sample for 0.00 sets of samples 0.00 failures in a 0.00 test sample for PE mode Frequency: 0.10 sample/sec	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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-Slow Response (Bank 2, Sensor 1)	P0153	This DTC determines if the O2 sensor response time is degraded	LRA > 0.00 msec RLA > 0.00 msec	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable Criteria • Bank 1 Sensor1 circuit and heater DTCs (P0131, P0132, P0134, P0135) = False • Bank 2 Sensor1 circuit and heater DTCs (P0151, P0152, P0154, P0155) = False • Misfire DTC (P0300) = False • Coolant temp > 50.00 °C • Engine run time > 60 seconds • Canister purge duty cycle > 0.00 % • 12.00 gps < MAF < 29.00 gps • 1200.00 < RPM < 3000.00 • Throttle position > 1.99 % • Fuel state = closed loop	100000.00 milliseconds Frequency: Once per trip	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
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O2S Circuit-No Activity Detected (Bank 2,Sensor 1)	P0154	This DTC determines if the O2 sensor is open.	0.00 millivolts < O2 sensor < 0.00 millivolts	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific_Enable_Criteria • Engine run time > 200.00 seconds • O2 location warm • Fuel state = closed loop (for post catalyst sensors only) • No O2 sensor heater DTCs (for post catalyst sensors only)	0.00 test failures in a 0.00 test sample Frequency: Continuous for pre catalyst sensors Once/trip for post catalyst sensors	DTC Type B
O2S Heater Circuit Malfunction (Bank 2, Sensor 1)	P0155	This DTC determines if the O2 sensor heater is degraded.	The elapsed time to obtain ± 150 millivolts from the mean O2 bias voltage. *Time based on table: Time vs Start Up Coolant Temp.	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable_Criteria • Current start = cold start • 0.00 mV< start-up bias voltage < 0.00 mV	One test/trip	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
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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 Heater Circuit Malfunction (Bank 2, Sensor 1)	P0155	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.	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active • ECT < 35.00 °C • IAT < 35.00 °C • ΔECT-IAT ≤ 6.02 °C • Avg MAF < 18.00 gps • 9.00 < System Voltage < 18.00	From cold start to a maximum time of 30 seconds. Frequency: *Time determined by table.	DTC Type B
System Too Lean (Bank 1)	P0171	Determines if the system is in a lean condition.	The average of long term fuel trim samples ≥ 1.20 And The average of short term fuel trim samples ≥ 0.10	• The following DTC's are not set: VSS, EST, Crank sensor, CAM sensor, TPS, Misfire, IAC, Fuel Injector, MAF, O2 sensor, MAP, EGR, Evap., ECT, or IAT DTC's • Engine speed > 575.00 rpm but < 4000.00 rpm • Baro > 70.00 kpa (8500 ft) • ECT > 20.00 °C but < 110.00 °C • MAP > 18.01 kpa but < 105.00 kpa • IAT > -18.01 °C but < 70.00 °C • Air flow > 2.80 g/s < 150.00 g/s • Vehicle speed < 82.00 mph	If lean counter is ≥5.00 tests Frequency: Continuous	DTC Type B
System Too Rich (Bank 1)	P0172	Determines if the system is in a rich condition.	The average of long term fuel trim samples ≤ 0.80 And The average of short term fuel trim samples ≤ 1.90	• The following DTC's are not set: VSS, EST, Crank sensor, CAM sensor, TPS, Misfire, IAC, Fuel Injector, MAF, O2 sensor, MAP, EGR, Evap., ECT, or IAT DTC's • Engine speed > 575.00 rpm but < 4000.00 rpm • Baro > 70.00 kpa (8500 ft) • ECT > 20.00 °C but < 110.00 °C • MAP > 18.01 kpa but < 105.00 kpa • IAT > -18.01 °C but < 70.00 °C • Air flow > 2.80 g/s < 150.00 g/s • Vehicle speed < 82.00 mph	If lean counter is ≥5.00 tests Frequency: Continuous	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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 2)	P0174	Determines if the system is in a lean condition.	The average of long term fuel trim samples ≥ 1.20 And The average of short term fuel trim samples ≥ 0.10	• The following DTC's are not set: VSS, EST, Crank sensor, CAM sensor, TPS, Misfire, IAC, Fuel Injector, MAF, O2 sensor, MAP, EGR, Evap., ECT, or IAT DTC's • Engine speed > 575.00 rpm but < 4000.00 rpm • Baro > 70.00 kpa (8500 ft) • ECT > 20.00 °C but < 110.00 °C • MAP > 18.01 kpa but < 105.00 kpa • IAT > -18.01 °C but < 70.00 °C • Air flow > 2.80 g/s < 150.00 g/s • Vehicle speed < 82.00 mph	If lean counter is ≥5.00 tests Frequency: Continuous	DTC Type B
System Too Rich (Bank 2)	P0175	Determines if the system is in a rich condition.	The average of long term fuel trim samples ≤ 0.80 And The average of short term fuel trim samples ≤ 1.90	• The following DTC's are not set: VSS, EST, Crank sensor, CAM sensor, TPS, Misfire, IAC, Fuel Injector, MAF, O2 sensor, MAP, EGR, Evap., ECT, or IAT DTC's • Engine speed > 575.00 rpm but < 4000.00 rpm • Baro > 70.00 kpa (8500 ft) • ECT > 20.00 °C but < 110.00 °C • MAP > 18.01 kpa but < 105.00 kpa • IAT > -18.01 °C but < 70.00 °C • Air flow > 2.80 g/s < 150.00 g/s • Vehicle speed < 82.00 mph	If lean counter is ≥5.00 tests Frequency: Continuous	DTC Type B
Fuel Injector Circuit Fault - Cylinder 1	P0201	This DTC checks the Fuel Injectors for electrical integrity	Output state is invalid	• PCM state = run	20.00 seconds Frequency: 1 second loop Continuous	DTC Type B
Fuel Injector Circuit Fault - Cylinder 2	P0202	This DTC checks the Fuel Injectors for electrical integrity	Output state is invalid	• PCM state = run	20.00 seconds Frequency: 1 second loop Continuous	DTC Type B
Fuel Injector Circuit Fault - Cylinder 3	P0203	This DTC checks the Fuel Injectors for electrical integrity	Output state is invalid	• PCM state = run	20.00 seconds Frequency: 1 second loop Continuous	DTC Type B
Fuel Injector Circuit Fault - Cylinder 4	P0204	This DTC checks the Fuel Injectors for electrical integrity	Output state is invalid	• PCM state = run	20.00 seconds Frequency: 1 second loop Continuous	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
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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 Circuit Fault - Cylinder 5	P0205	This DTC checks the Fuel Injectors for electrical integrity	Output state is invalid	• PCM state = run	20.00 seconds Frequency: 1 second loop Continuous	DTC Type B
Fuel Injector Circuit Fault - Cylinder 6	P0206	This DTC checks the Fuel Injectors for electrical integrity	Output state is invalid	• PCM state = run	20.00 seconds Frequency: 1 second loop Continuous	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
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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
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 Emission Failure Threshold = 1.25% Catalyst Damage Threshold = 1.25% to 15.0% misfire, depending on engine speed and engine load	• None of the following DTCs set: VS sensor, Crank sensor, TP sensor, MAP sensor, ECT sensor, CAM sensor, MAF sensors IAT sensor **(not applicable to this application)** P1336 - Crankshaft Position System Variation Not Learned • Engine run time >0 sec • Fuel cutoff not active • Power management not active • Brake torque management not active • Fuel level > 10 (disablement ends 1800.00 seconds after a low fuel level condition ceases and fuel disable does not occur with a fuel sensor DTC) • -6.99 °C < ECT < 123.98 ° C • If ECT at startup < -6.99 °C, then disable until ECT > 21.09 °C • 450.00 RPM < Engine speed < 5900.00 RPM • 9.00 volts < System voltage < 18.00 volts • + Throttle position Δ < 6.25 % / 100ms • - Throttle position Δ < 1.56 %/100ms • Misfire Diag is not requesting to disable TCC when transmission is in hot mode. • Power Take Off is disabled **(not applicable to this application)** • No abnormal engine speed. • Filtered engine speed is not changing rapidly • No ABS rough road. • No excessive drive wheel slip (drive wheel slip occurs if {Non Drive Wheel Speed > 255 MPH} and {Drive Wheel Speed - Non Drive Wheel Speed > 255 MPH} and {wheel speed data is valid}) • No ABS or TCS active. • AC compressor has not just engaged or disengaged. • Positive or zero torque. • EGR Intrusive test not active. • AIR Intrusive test not active. • Camshaft sensor is in sync with crank sensor. • Automatic transmission is not shifting. • No Abusive Engine Speed (Abusive engine speed is > 12000 rpm, delay occurs 0 engine cycles after abusive engine speed ceases)	Emission Exceedence = (5) failed 200 revolution blocks of 16. Failure reported with (1) Exceedence in 1st (16) 200 revolution block, or (4) Exceedences thereafter. 1st Catalyst Exceedence = Number of 200 revolution blocks as data supports for catalyst damage. 2nd and 3rd Catalyst Exceedence = (1) 200 revolution block with catalyst damage. Failure reported with (3) Exceedences in FTP, or (1) Exceedence outside FTP. Frequency: Continuous	DTC Type B *EMISSION* DTC Type B CATALYST DAMAGING

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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 Conditions • None of the following DTCs set: Vehicle speed sensor, Throttle position sensor, Coolant temperature sensor, CAM sensor Crank sensor • Engine running longer than 30 seconds • Ignition voltage > 9 volts • Throttle position > 15.00 % • Coolant temperature > 60.00 °C • Engine speed between 1000 & 5000 RPM • Cylinder air mass > 45.00 % • Spark retard < 15.01 degrees Determine Fault Region • Average voltage > 4.80 volts	Frequency: Every combustion event Continuous 480 test failures out of 500 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 Conditions • None of the following DTCs set: Vehicle speed sensor, Throttle position sensor, Coolant temperature sensor, CAM sensor Crank sensor • Engine running longer than 30 seconds • Ignition voltage > 9 volts • Throttle position > 15.00 % • Coolant temperature > 60.00 °C • Engine speed between 1000 & 5000 RPM • Cylinder air mass > 45.00 % • Spark retard < 15.01 degrees Determine Fault Region • Instantaneous voltage - average voltage is too small; delta from average < .031	Every combustion event Continuous 480 test failures out of 500 samples	DTC Type B

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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 2 Input Fault	P0332	This diagnostic will detect a wiring fault with knock sensor 2	Output voltage amplitude is low and stays relatively constant	Enable Conditions • None of the following DTCs set: Vehicle speed sensor, Throttle position sensor Coolant temperature sensor, CAM sensor Crank sensor • Engine running longer than 30 seconds • Ignition voltage > 9 volts • Throttle position > 15.00 % • Coolant temperature ³ 60.00 °C • Engine speed between 1000 & 5000 RPM • Cylinder air mass > 45.00 % • Spark retard < 15.01 degrees Determine Fault Region • Instantaneous voltage - average voltage is too small; delta from average < .03125	Frequency: Every combustion event Continuous 0.00 test failures out of 0.00 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. Frequency: 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. Frequency: Continuous	DTC Type B

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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 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*** • None of the following DTCs set: Fuel Injector, Crank, TP sensor, MAP sensor VS sensor, IAT sensor, ECT sensor, IAC Linear EGR Pintle Position, Misfire, MAF sensor • MAP Δ < 3.00 kpa • RPM Δ < 350 RPM • MPH Δ < 5.00 • ECT > 75.00 ° C • Baro > 70.00 kpa (8500 ft) • Vehicle Speed > 30 mph • IAC Δ < 15.00 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 < 3.00 kpa • MAP > 15.00 kpa but < 70.00 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.	Frequency: 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 > 7.00 kpa AND current map diff > 2.00 kpa THEN 4.00 tests will be run per trip until 24.00 tests have been met	Frequency: 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 Frequency: 100ms loop Continuous	DTC Type B
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 Frequency: 100ms loop Continuous	DTC Type B

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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 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 < 6.99 counts	• EGR valve icing or over temperature not occurring Ignition voltage ≥ 10.00 volts	20.00 seconds Frequency: 100ms loop Continuous	DTC Type B
AIR Injection System Malfunction	P0410	This diagnostic will detect an Air Pump that is not flowing the correct amount of air into the exhaust system.	Non-Intrusive Test Test is run at engine start up before closed loop is achieved. The Oxygen Sensor voltage must be forced below 151.91 mV by the Air Pump for a lean ratio of time > 3 secs OR Rich ratio of time < 0.8 Intrusive Test The Air Pump will be turned on to force a change in the Oxygen Sensor signal or a change in a short term fuel integrator value. Short term integrator must shift > 0.15 OR the Oxygen Sensor signal must be forced continuously below 400mV for > 1.7 seconds	Common Test Enable Conditions • None of the following DTCs set: TP Sensor, EVAP, O2 Sensor, Misfire, MAT sensor, MAP sensor, IAC, Fuel Trim Fuel Injector, EGR Sensor, ECT Sensor Crank Sensor, MAF sensor Non-Intrusive Test Enable Conditions • Engine run time > 210.00 seconds • Power enrichment mode not active • Catalyst overtemp mode not active • Decel fuel cutoff mode not active • Engine load > 24.00 % • TPS Delta < 5.00 % • 12.00 gps < Airflow < 24.00 gps Ignition voltage > 10.00 volts • 4.41 deg C < IAT < 70.00 deg C • 4.41 deg C < Coolant < 110.00 deg C Intrusive Test Enable Conditions • No VSS DTCs set • Air fuel ratio = 14.7:1 • Engine speed > 1000 rpm • 41.99 < Engine load < 41.99 % • Air flow < 18.5 gps • Ignition voltage > 10.00 volts • 4.41 deg C < Coolant < 110.00 deg C • 4.41 deg C < IAT < 70.00 deg C	Frequency: 1 pass per trip 3.00 failures consecutive in one trip (intrusive and non-intrusive tests are combined)	DTC Type B
AIR Solenoid Relay Circuit Fault	P0412	This DTC checks the output driver for electrical integrity	Output state invalid	• PCM state = crank or run	30.00 sec Frequency: Continuous	DTC Type B
AIR Pump Relay Circuit Fault	P0418	This DTC checks the output driver for electrical integrity	Output state invalid	• PCM state = crank or run	30.00 sec Frequency: Continuous	DTC Type B

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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
Catalyst Low Efficiency Bank 1	P0420	Oxygen Storage	OSC time difference ≥ 0.44 OSC time difference = OSC worst pass threshold - OSC compensation factor * (post cat O2 resp time - pre cat O2 resp time) OSC worst pass thresh = 3.075	• None of the following DTCs set: EST, EGR, MAT sensor, IAC, Fuel Injector, VS sensor, TP sensor, O2 sensor, Misfire, MAP sensor, Fuel Trim, ECT sensor ***Valid Idle Period Criteria*** • Engine speed ≥ 1000.00 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 ≤ 18.00 • Delta engine speed ≤ 200 ***Rapid Step Response Enable Criteria*** OSC time difference step ≥ 1.44 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
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 > 12.00 liters BEFORE Tank vacuum < 10.00 "H_2O	General Test Enable • None of the following DTCs set: MAT sensor, MAP sensor, TP sensor, O2 sensor VS sensor, Misfire, ECT sensor • 14.49 % < Fuel Level < 85.51 % • 10.00n V < System Voltage < 18.00 V • 3.75 °C < IAT < 32.19 °C • Engine coolant temp < 32.19 °C • Baro > 75.00 kPa (8000 ft) Cold Start Test • IAT < 32.19 °C • Cold temperature Δ(ECT-IAT): < 102 °C if IAT>ECT • < 8 °C if ECT > IAT • Engine run time < 165.00 seconds	Once per cold start Time is dependent on driving conditions Minimum time is at least 165 Seconds Max. before test abort is 550.00 seconds	DTC Type A (Behaves as a type B)

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Evap. Emission Control System Leak Detected (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	0.04" EWMA Value > 0.02 in. dia. OR 0.02" EWMA Value > 0.01 in. dia.	General Test Enable • None of the following DTCs set: MAT sensor, MAP sensor, TP sensor, O2 sensor, VS sensor, Misfire, ECT sensor • 14.49 % < Fuel Level < 85.51 % • 10.00 V < System Voltage < 18.00 V • 3.75 °C < IAT < 32.19 °C • Engine coolant temp < 32.19 °C • Baro > 75.00 kPa (8000 ft) • VSS < 75.00 mph (0.02" leak only) • 61.99 % < Fuel level < 85.51 % (0.02" leak only) • Δ Vacuum Slosh < 32.00 "H2O OR Δ Fuel Slosh < 15.37 % (if occurs, test will try to run, again) • Lesser levels of slosh, the 0.02" EWMA will not be updated Cold Start Test • IAT < 32.19 °C • Cold temperature Δ(ECT-IAT): < 102 °C if IAT>ECT • < 8 °C if ECT > IAT • Engine run time < 165.00 seconds	Once per cold start Time is dependent on driving conditions Minimum time is at least 165 Seconds Max. before test abort is 550.00 seconds	DTC Type A
Canister Purge Circuit Fault	P0443	This DTC checks the output driver for electrical integrity	Output state invalid	• PCM state = crank or run	30 sec Frequency: Continuous	DTC Type B
Evap. Emission Control System – Vent Control Malfunction	P0446	This DTC will determine if a restriction is present in the vent solenoid, vent filler, vent hose or canister	Tank Vacuum > 10.00 "H2O BEFORE Purge Volume > 6	General Test Enable • None of the following DTCs set: MAT sensor, MAP sensor, TP sensor, O2 sensor, VS sensor, Misfire, ECT sensor • 14.49 % < Fuel Level < 85.51 % • 10.00 V < System Voltage < 18.00 V • 3.75 °C < IAT < 32.19 °C • Engine coolant temp < 32.19 °C • Baro > 75.00 kPa (8000 ft)	Once per trip Time is dependent on driving conditions	DTC Type A (behaves as a 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	Frequency: 30 sec Continuous	DTC 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.	Tank vacuum voltage < 0.06 volts	• 0.50 second delay after sensor power up for sensor warm-up	5.00 seconds Frequency: Continuous	DTC Type B

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Evap. Fuel Tank Pressure Sensor Circuit High Voltage	P0453	This DTC will detect a vacuum sensor signal that is too high out of range.	Tank vacuum voltage < 4.90 volts	• 0.50 second delay after sensor power up for sensor warm-up	5.00 seconds Frequency: Continuous	DTC Type B
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 28 counts OR • ClassII/UART: Communication between the cluster and PCM is lost • Default to gauge: 0.00 % • Default to evap and misfire: 40%	Frequency: 12.5 ms Continuous Failed for 10.00 consecutive seconds	DTC 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 > 150 counts OR • ClassII/UART: Communication between the cluster and PCM is lost • Default to gauge: 0.00 % • Default to evap and misfire: 40%	Frequency: 12.5 ms Continuous Failed for 25.00 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	Frequency: 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	Frequency: 30 sec Continuous	DTC Type B
Manual Transmission Vehicle Speed Sensor	P0500	This diagnostic will detect a failed vehicle speed sensor on manual transmissions	Engine_Speed > 1250.00 RPM AND Vehicle Speed < 0.00 MPH	• Engine Running • Transmission is in gear • Airflow between 0.00 mg/cyl and 0.00 mg/cyl • Engine Acceleration between 0.00 RPM/sec and 0.00 RPM/sec All of the above for 1.00 seconds	Fault present for 20.00 seconds Frequency: 100ms loop Continuously	DTC Type B

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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:*** • None of the following DTCs set: CCP, Misfire, EGR, TP sensor, VS sensor, ECT sensor, MAP sensor, IAT, Fuel Trim, Fuel Injector, Crank sensor, MAF sensor • ECT > 70.00 °C • System Voltage > 9.00 V but < 18.00 V • IAT > -18.01 °C • Engine run time > 120.00 seconds • Baro > 70.00 kPa (12000 ft) • TP < 1.41 % • VS < 3.00 MPH • Above met for a time > 5 seconds to enable diagnostic.	8.00 seconds Frequency: Continuos after enable	DTC Type B
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 + 150)	***Test Enable:*** • None of the following DTCs set: CCP, Misfire, EGR, TP sensor, VS sensor, ECT sensor, MAP sensor, IAT, Fuel Trim, Fuel Injector, Crank sensor, MAF sensor • ECT > 70.00 °C • System Voltage > 9.00 V but < 18.00 V • IAT > -18.01 °C • Engine run time > 120.00 seconds • Baro > 70.00 kPa (12000 ft) • TP < 1.41 % • VS < 3.00 MPH • Above met for a time > 5 seconds to enable diagnostic..	8.00 seconds Frequency: 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 Frequency: 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 Frequency: 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	30.00 sec Frequency: Continuous	DTC Type B

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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
Oxygen Sensor Circuit - Too Few O2S R/L and L/R Switches (Bank 1, Sensor 1)	P1133	This DTC determines if the O2 sensor is no longer sufficiently switching.	L/R switches < 35.00 OR R/L switches < 30.00	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable_Criteria • Misfire DTC (P0300) = False • Coolant temp > 50.00 °C • Engine run time > 60.00 seconds • Canister purge duty cycle > 0.00 % • 12.00 gps < MAF < 29.00 gps • 1200.00 < RPM < 3000.00 • Throttle position > 1.99 % • Fuel state = closed loop	100000.00 milliseconds Frequency: Once per trip	DTC Type B
Oxygen Sensor Circuit - Transition Switch Time Ratio Malfunction (Bank 1, Sensor 1)	P1134	This DTC determines if the O2 sensor response ratio is degraded	RLA/LRA < 0.375 OR RLA/LRA > 4.8125	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable_Criteria • Misfire DTC (P0300) = False • Coolant temp > 50.00 °C • Engine run time > 60.00 seconds • Canister purge duty cycle > 0.00 % • 12.00 gps < MAF < 29.00 gps • 1200.00 < RPM < 3000.00 • Throttle position > 1.99 %	100000.00 milliseconds Frequency: Once per trip	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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
Oxygen Sensor Circuit - Too Few O2S R/L and L/R Switches (Bank 2, Sensor 1)	P1153	This DTC determines if the O2 sensor is no longer sufficiently switching.	L/R switches < 0.00 OR R/L switches < 0.00	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable_Criteria • Misfire DTC (P0300) = False • Coolant temp > 50 °C • Engine run time > 60.00 seconds • Canister purge duty cycle > 0.00 % • 12.00 gps < MAF < 29.00 gps • 1200 < RPM < 3000.00 • Throttle position > 1.99 % • Fuel state = closed loop	100000.00 milliseconds Frequency: Once per trip	DTC Type B
Oxygen Sensor Circuit - Transition Switch Time Ratio Malfunction (Bank 2, Sensor 1)	P1154	This DTC determines if the O2 sensor response ratio is degraded	RLA/LRA < 0 OR RLA/LRA > 0	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active Specific Enable_Criteria • Misfire DTC (P0300) = False • Coolant temp > 50.00 °C • Engine run time > 60.00 seconds • Canister purge duty cycle > 0.00 % • 12.00 gps < MAF < 29.00 gps • 1200.00 < RPM < 3000.00 • Throttle position > 1.99 %	100000.00 milliseconds Frequency: Once per trip	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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 2, Sensor 1)	P1154	This DTC diagnoses degraded slow rich to lean or lean to rich response times.	Ratio of average response times. Ratio > 0.00 or < 0.00)	Common Enable Criteria • None of the following DTCs set: TP sensor, MAP sensor, ECT sensor, AIR (if applicable), MAF sensor, IAT sensor, Evap., Fuel Injector • EGR flow diagnostic = Not Active • Catalyst monitor diagnostic = Not Active • Fuel trim diagnostic = Not Active • 9.00 volts < system voltage < 18.00 volts • Device control = Not Active • Closed loop	100000.00 milliseconds seconds after closed loop enable Frequency: 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 Frequency: 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 Frequency: 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 Frequency: 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 Frequency: 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 Frequency: Every engine cycle Continuous	DTC Type B
Crank to Low Res Correlate	P1374	Pulsed 0V to 10V	3X signal 24X signal	• Engine runtime > 3 sec • Incorrect number of 3X signals per engine cycle	290.00 out of 300.00 test samples Frequency: Continuous	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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
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)
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 70.00 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 > 3.91 counts from closed position	• EGR valve icing or over temperature not occurring Ignition voltage ≥ 10.00 volts	4.00 separate failures for 20 seconds (with pintle movement > 40.00 % for 0.50 seconds opening time between tests) <u>Frequency:</u> 100ms loop Continuous	DTC Type B
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 > 8.00 ”H2O (cold start) OR 8.00 ”H2O (hot start) for 4.00 sec BEFORE Test time > 50 seconds (cold start) OR 25 seconds (hot start)	<u>General Test Enable</u> • None of the following DTCs set: MAT sensor, MAP sensor, TP sensor, O2 sensor, VS sensor, Misfire, ECT sensor • 14.49 % < Fuel Level < 85.51 % • 10.00n V < System Voltage < 18.00 V • 3.75 °C < IAT < 32.19 °C • Engine coolant temp < 32.19 °C • Baro > 75.00 kPa (8000 ft)	Once per trip Cold start: max time is 50 seconds Hot start: max time is 25 seconds	DTC Type B

2001 3.1L (LG8), 3.4L (LA1), 3.5L (LX5 *with emission label* 1GMXV03.5065), 3.8L (L36), 3.8L (L67) *supercharged*
ENGINE DIAGNOSTIC PARAMETERS

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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 Cooling System Performance	1483	This DTC compares the actual coolant temperature to a predicted coolant temperature to determine if there is a fault in the cooling system	Actual coolant temperature - predicted coolant temperature > 7.00	• None of the following DTCs set: Coolant sensor, Crank Sensor, MAF sensor, IAT sensor, VS sensor, MAP sensor faults • PRNDL = D3 or D4 or PRNDL fault • Engine coolant temp. ≤ 115.00 °C • Vehicle Speed ≥ 10 mph and < 80.00 mph for 10.00 seconds • Engine Load > 10.00 and ≤ 80.00 • IAT ≤ 80.00 °C • If IAT < 0.00 °C then predicted coolant temp. = 100.00 °C • Engine speed ≤ 1000.00 RPM and ≥ 3500.00 RPM • [(Coolant temp > 105.00 °C if last report a pass or Coolant temp > 95.00 °C if last report a fail) and Filtered vehicle speed delta < 0.50 and Filtered engine load delta < 5.00 and Filtered engine speed delta < 50.00] for 10.00 seconds	Frequency: 1 second activation rate Runs continuously	Type C
V5BA Voltage Circuit Fault	P1635	5 Volts	Voltage state invalid	• PCM state = run	10.00 sec Frequency: 100ms loop Continuous	DTC Type B
V5BB Voltage Circuit Fault	P1639	5 Volts	Voltage state invalid	• PCM state = run	10.00 sec Frequency: 100ms loop Continuous	DTC Type B