2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Heater Control Circuit Bank 1 Sensor 1	P0030	Output state invalid	Circuit fault indicated	11 V < System Voltage < 18 V Engine Speed > 425 RPM	10 fails out of 12 samples	DTC Type B
HO2S Heater Control Circuit Bank 1 Sensor 2	P0036	Output state invalid	Circuit fault indicated	11 V < System Voltage < 18 V Engine Speed > 425 RPM	10 fails out of 12 samples	DTC Type B
MAP/MAF/Throttle Position Correlation	P0068	Detect when Manifold Absolute Pressure and Measured Airflow does not match estimated engine airflow as established by the TPS	Difference between measured MAP and Estimated MAP < 30 kPa Difference between measured MAF and Estimated MAF < 20 kPa	Engine running =true No PCM Processor DTC´s No throttle actuation DTC´s Both TPS circuits DTC´s are set.	175 ms continuous in the main µP	DTC Type A
Mass Airflow (MAF) Sensor Performance	P0101	This DTC determines if the MAF sensor is stuck within the normal operating range.	Filtered airflow error > 10 grams per second and Filtered manifold pressure 2 error > 20 kPa and Filtered throttle error < 230 kPa grams per second	No MAF circuit DTCs set No MAP circuit DTCs set No EGR DTCs set No ECT circuit DTCs set No IAT circuit DTCs set No CKP DTCs set 400 RPM < Engine Speed < 6400 RPM 70°C < Engine Coolant Temperature < 125°C -7°C < Intake Air Temperature < 125°C	Immediate Frequency: 12.5 ms loop Continuous	DTC Type B
MAF Sensor Circuit Low Frequency	P0102	This DTC detects a continuous short to low or open in either the signal circuit or the MAF sensor.	MAF sensor signal< 100 Hz	Engine Run Time > 5 seconds Engine Speed > 500 rpm System Voltage > 11 V Enable Criteria Stable Time > 2.5 seconds	30 test failures in a 40 test sample 80 samples/sec	DTC Type B
MAF Sensor Circuit High Frequency	P0103	This DTC detects a continuous short to high in either the signal circuit or the MAF sensor.	MAF sensor signal >11000 Hz	Engine Run Time > 5 seconds Engine Speed > 500 rpm System Voltage > 11 V Enable Criteria Stable Time > 2.5 seconds	30 test failures in a 40 test sample 80 samples/sec	DTC Type B
Manifold Absolute Pressure (MAP) Sensor 1 Performance	P0106	This DTC determines if the MAP sensor is stuck within the normal operating range.	Filtered manifold pressure 1 error > 20 kPa and Filtered manifold pressure 2 error > 20 kPa and Filtered throttle error < 230 kPa grams per second	No MAF circuit DTCs set No MAP circuit DTCs set No EGR DTCs set No ECT circuit DTCs set No IAT circuit DTCs set No CKP DTCs set 400 RPM < Engine Speed < 6400 RPM 70°C < Engine Coolant Temperature < 125°C -7°C < Intake Air Temperature < 125°C	Immediate Frequency: 12.5 ms loop Continuous	DTC Type B
MAP Circuit Low Input	P0107	This DTC detects a continuous short to low or open in either the signal circuit or the MAP sensor.	MAP < 1.0% of 5 Volt reference	No TPS DTC's No 5 Volt Reference DTC's Controller State = RUN [(TPS ≥ 0% & Engine Speed ≤ 1100 rpm) or (TPS ≥ 9.9% & Engine Speed > 1100 rpm)]	30 test failures in a 40 test sample 20 samples/sec	DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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
MAP Circuit High Input	P0108	This DTC detects a continuous short to high or open in either the signal circuit or the MAP sensor.	MAP > 98.0% of 5 Volt reference	No TPS DTC's No 5 Volt Reference DTC's Controller State = RUN Engine Run Time > table value based on start-up coolant temperature [(TPS < 89.9% & Engine Speed ≤ 1000 rpm) or (TPS < 97.5% & Engine Speed > 1000 rpm)]	30 test failures in a 40 test sample 20 samples/sec	DTC Type B
IAT Sensor Circuit Low Voltage	P0112	This DTC determines if the IAT sensor is shorted low by checking for an IAT sensor resistance below a threshold	IAT Resistance < 25 Ω	No ECT DTC's No VSS DTC's ECT < 110°C VSS >= 40 kph Engine Run Time > 10 seconds	10 test failures in a 20 test sample 4 samples/sec	DTC Type B
IAT Sensor Circuit High Voltage	P0113	This DTC determines if the IAT sensor is shorted high by checking for an IAT sensor resistance above a threshold	IAT Resistance > 1800000 Ω	No ECT DTC's No VSS DTC's No MAF DTC's ECT >= 50°C VSS < 1.6 kph MAF < 12 g/s Engine Run Time > 10 seconds	10 test failures in a 20 test sample 4 samples/sec	DTC Type B
ECT Sensor Circuit Low Voltage	P0117	This DTC determines if the ECT sensor is shorted low by checking for an ECT sensor resistance below a threshold	ECT Resistance < 25 Ω	No IAT DTC's IAT ≤ 70 °C or Engine run time ≥ 10 sec.	10 test failures in a 100 test sample 1 sample/sec	DTC Type B
ECT Sensor Circuit High Voltage	P0118	This DTC determines if the ECT sensor is shorted high by checking for an ECT sensor resistance above a threshold	ECT Resistance > 1800000 Ω	No IAT DTC's IAT ≥ -7 °C or Engine run time ≥ 60 sec.	10 test failures in a 100 test sample 1 sample/sec	DTC Type B
Throttle Position (TP) Sensor 1 Circuit	P0120	Detects a continuos or intermittent short or open in TP sensor #1 circuit	Raw TPS sensor signal > 4.70 V	Ignition in unlock/accessory, run or crank Ignition Voltage>5.23 V No PCM processor DTC No Vref Fault	20/40 Cts 10 Cnts Continuous 12.5 ms /Ct in the MCP	DTC Type A MIL
Throttle Position (TP) Sensor 1 Performance	P0121	This DTC determines if the TP sensor is stuck within the normal operating range.	Filtered throttle error > 230 kPa grams per second and Filtered manifold pressure 2 error < 20 kPa	No MAF circuit DTCs set No MAP circuit DTCs set No EGR DTCs set No ECT circuit DTCs set No IAT circuit DTCs set No CKP DTCs set 400 RPM < Engine Speed < 6400 RPM 70°C < Engine Coolant Temperature < 125°C -7°C < Intake Air Temperature < 125°C	Immediate Frequency: 12.5 ms 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
Engine Coolant Temperature (ECT) Insufficient for Closed Loop Fuel Control	P0125	This DTC detects if the engine coolant temperature rises too slowly due to an ECT sensor or cooling system fault.	Actual accumulated airflow > predicted accumulated airflow and engine coolant temperature > -7 °C A Airflow is accumulated every second if 10 grams per sec < airflow < 75 grams per sec	No MAF, IAT, or VSS DTCs set No ECT sensor circuit DTCs set Start up ECT < 75°C Minimum Average Airflow > 30 gram per second Vehicle speed > 5 MPH for 1 kilometer 30 sec < Engine Run Time < 1800 sec IAT ≥ 7 °C	30 seconds Frequency: Once per ignition cycle 1 second loop	DTC Type B
Engine Coolant Temperature (ECT) Below Thermostat Regulating Temperature	P0128	This DTC detects if the engine coolant temperature rises too slowly due to an ECT sensor or cooling system fault.	Actual accumulated airflow > predicted accumulated airflow and engine coolant temperature > 80 °C Airflow is accumulated every second if 20 grams per sec < airflow < 75 grams per sec	No MAF, IAT, or VSS DTCs set No ECT sensor circuit DTCs set Start up ECT < 80 °C Minimum Average Airflow > 5 gram per second Vehicle speed > 5 MPH for 1 kilometer 30 sec < Engine Run Time < 1800 sec IAT ≥ -7 °C	30 seconds Frequency: Once per ignition cycle 1 second loop	DTC Type B
HO2S Closed Loop Rationality Bank 1 Sensor 1	P0130	This DTC determines if the O2 sensor voltage is not meeting the voltage criteria to enable closed loop fueling.	Closed loop fuel control O2 sensor Ready flag set to "Not Ready." O2 sensor voltage must be > 550 millivolts or < 350 millivolts for forty counts to set closed loop fuel O2 Ready flag. Once set to "Ready," the O2 sensor voltage cannot be > 350 millivolts and < 550 millivolts for > 5 seconds or the O2 Ready flag will be reset to "Not Ready."	No injector DTC's No MAF DTC's No ETC DTCs No TP sensor DTC's No MAP DTC's No ECT sensor DTC's No Bank 1 Sensor 1 DTC'sor Engine Run Time > 200 sec. Coolant temp > 70 C 11 volts < Ignition Voltage < 18 volts Traction control not active. Catalyst Protection mode not active. 1000 RPM ≤ Engine Speed ≤ 3400 RPM 10.0 grams per second ≤ MAF ≤ 50.0 grams per second Decel Fuel Cut Off not active. Power Enrichment not active. Above conditions must be met for 5.0 seconds.	400 test failures in a 500 test sample. 100 millisecond execution rate. 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
HO2S Circuit Low Voltage (bank 1 sensor 1)	P0131	This DTC determines if the O2 sensor or circuit is shorted to low by checking for a lean condition.	O2 sensor voltage < 50 millivolts	No injector DTC's No MAF DTC's No ETC DTCs No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's Catalyst diagnostic test not active Closed Loop Fuel Enabled No injectors are disabled Traction control not active 11 volts < Ignition Voltage < 18 volts 14.5 ≤ Air/Fuel ratio ≤ 14.8 15% ≤ Throttle position ≤ 50 % Above conditions must be met for 2.0 seconds.	950 test failures in a 1000 test sample for 1 sets of samples 100 millisecond execution rate. Continuous	DTC Type B
HO2S Circuit High Voltage (bank 1 sensor 1)	P0132	This DTC determines if the O2 sensor or circuit is shorted to high by checking for a rich condition.	O2 sensor voltage > 1000 millivolts	No injector DTC's No MAF DTC's No ECT DTCs No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's Catalyst diagnostic test not active Closed Loop Fuel Enabled Traction control not active 11 volts < Ignition Voltage < 18 volts 14.5 ≤ Air/Fuel ratio ≤ 14.8 0% ≤ Throttle position ≤ 50 % Above conditions must be met for 2.0 seconds.	140 test failures in a 150 test sample for 1 sets of samples 100 millisecond execution rate. 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
HO2S Circuit Slow Response (bank 1 sensor 1)	P0133	This DTC determines if the O2 sensor functioning properly by checking its response time.	O2 sensor average transition time: L/R > 100 msec R/L > 75 msec 450 mv < O2 voltage < 650 mv.	No misfire DTC's No injector DTC's No MAF DTC's No ETC DTCs No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No AIR DTC's No Bank 1 Sensor 1 Voltage DTC's No front O2 Heater Circuit DTC No front O2 too Few Switches DTC Catalyst diagnostic test not active Closed Loop Fuel Enabled Traction control not active No injectors are disabled 11 volts < Ignition Voltage < 18 volts Engine Run Time > 200 sec. Coolant temp > 70 C 1000 < RPM < 3500 15.0 grams per second < MAF < 50.0 grams per second Throttle position ≥ 5 % Transmission not in Park, Reverse or Neutral Above conditions met for 2.0 seconds.	60.00 seconds Once per key cycle	DTC Type B
HO2S Circuit Insufficient Activity (bank 1 sensor 1)	P0134	This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open.	400 mv < O2 sensor voltage < 500 millivolts .	No injector DTC's No MAF DTC's No ETC DTCs No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's Catalyst diagnostic test not active Traction control not active 11 volts < Ignition Voltage < 18 volts Engine run time > 200 seconds	950 test failures in a 1000 test sample 100 millisecond execution rate. Continuous	DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Heater Circuit (bank 1 sensor 1)	P0135	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	The heater current is < 0.30 amps or > 1.69 amps	No front O2 Heater Control Circuit DTC Delta ignition voltage during current measurement < 1 volt Engine Run Time > 60 seconds 500 RPM < Engine Speed < 3000 RPM 5 grams per second < MAF < 2540 grams per second O2 heater overtemp control not active. Above conditions must be met for 2.0 seconds.	Average of 50 current samples compared to thresholds for each test. 5 tests per key cycle, 20 second delay between tests. 100ms second execution rate.	DTC Type B
O2S Circuit Bank 1 Sensor 2	P0136	This DTC determines if the post catalyst O2 sensor is stuck in a normal voltage range and thereby can no longer be used for post oxygen sensor fuel control or for catalyst monitoring. The diagnostic includes a passive (stage 1) test and an intrusive (stage 2) test. The stage 2 increases or reduces delivered fuel to achieve the required rich or lean threshold.	Post catalyst O2 sensor cannot achieve voltage ≥ 700 millivolts and voltage ≤ 300 millivolts	Common Enable Criteria • No O2 circuit, heater, response or heater driver DTC's active • No TP Sensor DTC's • No MAF DTC's • No ETC DTCs • No ECT DTC's • No MAP DTC's • No IAT DTC's • No EVAP DTC's • No Fuel Injector DTC's • No Fuel Trim DTC's • • 11 volts ≤ system voltage ≤ 18 volts • Engine Runtime ≥ 2 seconds Stage 2 Specific Enable Criteria: • Stage 1 portion of test not passed • 1000 rpm ≤ Engine Speed ≤ 5000 rpm • 14 gps ≤ Airflow ≤ 100 gps • 30 kph ≤ Vehicle Speed ≤ 130 kph All of the above met for at least 1 seconds, and then: • .94 ≤ Short term fuel trim ≤ 1.05 • Fuel state = closed loop • EVAP diagnostic not in control of purge	Stage 1: Up to 800 seconds Stage 2: Up to 12 seconds for each threshold Frequency: One test per trip	DTC Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit 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	O2 sensor voltage < 50 millivolts	No injector DTC's No MAF DTC's No ETC DTCs No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's Catalyst diagnostic test not active Closed Loop Fuel Enabled No injectors are disabled Traction control not active 11 volts < Ignition Voltage < 18 volts 14.5 ≤ Air/Fuel ratio ≤ 14.8 15% ≤ Throttle position ≤ 50 % Above conditions must be met for 2.0 seconds.	950 test failures in a 1000 test sample for 1 sets of samples 100 millisecond execution rate. Continuous	DTC Type B
HO2S Circuit High Voltage (bank 1 sensor 2)	P0138	This DTC determines if the O2 sensor or circuit is shorted to high by checking for a rich condition during steady throttle	O2 sensor voltage > 1000 millivolts	No injector DTC's No MAF DTC's No ETC DTCs No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's Catalyst diagnostic test not active Closed Loop Fuel Enabled Traction control not active 11 volts < Ignition Voltage < 18 volts 14.5 ≤ Air/Fuel ratio ≤ 14.80 15% ≤ Throttle position ≤ 50 % Above conditions must be met for 2.0 seconds.	950 test failures in a 1000 test sample for 1 sets of samples. 100 millisecond execution rate. Continuous	DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S Circuit Insufficient Activity (bank 1 sensor 2)	P0140	This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open.	425 mv < O2 sensor < 475 millivolts	No injector DTC's No MAF DTC's No ETC DTCs No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No Rear O2 Heater Circuit DTC Closed Loop Fuel Enabled Catalyst diagnostic test not active Traction control not active 11 volts < Ignition Voltage < 18 volts Engine run time > 200.00 seconds Minimum 3 occurrences of a delta TP sensor > 1 % during diagnostic test	950 test failures in a 1000 test sample 100 millisecond execution rate. Once per key cycle.	DTC Type B
HO2S Heater Circuit (bank 1 sensor 2)	P0141	This DTC determines if the O2 sensor heater is functioning properly by monitoring the current through the heater circuit.	The heater current is <.2 amps or > 1.5 amps	No rear O2 Heater Control Circuit DTC Delta ignition voltage during current measurement < 1 volt Engine Run Time > 60 seconds 500 RPM < Engine Speed < 3000 RPM 5 grams per second < MAF < 2540 grams per second O2 heater overtemp control not active. Above conditions must be met for 2.0 seconds.	Average of 50 current samples compared to thresholds for each test. 5 tests per key cycle, 20 second delay between tests 100ms execution rate	DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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 System Too Lean Bank 1	P0171	Determines if the fuel control system is in a lean condition.	The EWMA of long term fuel trim (LTM) samples ≥ 1.190002 for at least 2 seconds (Note: EWMA stands for "Exponentially Weighted Moving Average") Notes: 1. At least 35 seconds of data must accumulate on each trip before the EWMA of LTM samples is considered usable and at least 14 seconds of data in the current fuel trim cell must accumulate on each trip before the LTM for that cell is considered usable in the EWMA calculation.	• No Misfire DTC's • No O2 Sensor DTC's • No EVAP DTC's • No Fuel Injector DTC's • No Fuel Temperature or Composition DTC's • No IAC, MAF, or MAP DTC's • No ECT DTC's • No EGR DTC's • No A.I.R. DTC's • No TP Sensor or TAC System DTC's • 400 RPM < Engine speed < 6100 RPM rpm • BARO > 74 kpa • -7ºC < ECT < 120°C • 15 kpa < MAP < 100 kpa • -7 °C < IAT < 145°C • 1.0 grams per second < MAF < 512 grams per second • Vehicle speed < 82 mph • Closed Loop Fueling • Long Term Fuel Trim Learning enabled • Not in Device Control • EGR Flow Diagnostic Intrusive Test = Not Active • Catalyst Monitor Diagnostic Intrusive Test = Not Active • Post O2 Diagnostic Intrusive Test = Not Active • Evap diagnostic is at any stage except the "tank pull down" portion of the test. • Fuel Level > 10 % (must be < 10% for at least 30 seconds to disable; default is to enable if fuel sender is broken)	Frequency: Continuous 100 ms loop	DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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 System Too Rich Bank 1	P0172	Determines if the fuel control system is in a rich condition.	The EWMA of long term fuel trim (LTM) samples < 0.8500061 Once the above occurs, purge is ramped off to determine if excess purge is the cause. Therefore, the following must also occur to report a failure: The EWMA of LTM samples with purge off < 0.8099976 for at least 7 seconds during each of 3 intrusive segments. General Notes: 1. At least 35 seconds of data must accumulate on each trip before the EWMA of LTM samples is considered usable and at least 14 seconds of data in the current fuel trim cell must accumulate on each trip before the LTM for that cell is considered usable in the EWMA calculation. Intrusive Notes: 1. Segments can last up to 35 seconds, and are separated by the smaller of a 30 second purge-on time or enough time to purge 18 grams of vapor. 2. A maximum of 5 completed segments are allowed for each intrusive test, and up to 30 intrusive attempts allowed per trip. 3. After an intrusive test report is completed, another intrusive test cannot occur for 1200 seconds to allow sufficient time to purge excess vapors from the canister. During this period, fuel trim will pass if the EWMA of LTM samples > 0.8099976 for at least 60 seconds, indicating that the canister has been purged. Performing intrusive tests too frequently may also affect EVAP and FTP emissions, and the execution frequency of other diagnostics.	• No Misfire DTC's • No O2 Sensor DTC's • No EVAP DTC's • No Fuel Injector DTC's • No Fuel Temperature or Composition DTC's • No IAC, MAF, or MAP DTC's • No ECT DTC's • No EGR DTC's • No A.I.R. DTC's • No TP Sensor or TAC System DTC's • 400 RPM < Engine speed< 6100 RPM • BARO > 74 kpa • -7°C < ECT < 120°C • 15 kpa > MAP < 90 kpa • -7 °C < IAT < 145°C • 1.0 grams per second < MAF < 512 grams per second • Vehicle speed < 82 mph • Closed Loop Fueling • Long Term Fuel Trim Learning enabled • Not in Device Control • EGR Flow Diagnostic Intrusive Test = Not Active • Catalyst Monitor Diagnostic Intrusive Test = Not Active • Post O2 Diagnostic Intrusive Test = Not Active • Evap diagnostic is at any stage except the "tank pull down" portion of the test. • Fuel Level > 10 % (must be < 10% for at least 30 seconds to disable; default is to enable if fuel sender is broken) Intrusive Enable Criteria • The EWMA of long term fuel trim (LTM) samples < 0.82 • RPM > 400 • 1.0 grams per second < Mass Airflow < 512 grams per second • 15 kpa < MAP <100 kpa Temporary Intrusive Test Inhibit Criteria • If intrusive test segment exceeds 35 consecutive seconds. (in this case, purge valve is opened for the smaller of 30 seconds or enough time to purge 18 grams vapor before attempting additional intrusive segments)	If rich fail counter is ≥ 3 before pass counter ≥ 3, diagnostic fails. Frequency: Continuous 100 ms loop	DTC Type B
Fuel Injector 1 Control Circuit	P0201	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.0 for 5 seconds	10 failures out of 20 samples frequency: 250 ms cont.	DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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 2 Control Circuit	P0202	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.0 for 5 seconds	10 failures out of 20 samples frequency: 250 ms cont.	DTC Type B
Fuel Injector 3 Control Circuit	P0203	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.0 for 5 seconds	10 failures out of 20 samples frequency: 250 ms cont.	DTC Type B
Fuel Injector 4 Control Circuit	P0204	circuit continuity	Injector Driver feedback indication = fault	Ignition voltage > 11.0 for 5 seconds	10 failures out of 20 samples frequency: 250 ms cont.	DTC Type B
Throttle Position (TP) Sensor 2 Circuit	P0220	Detects a continuos or intermittent short or open in TP sensor #2 circuit	Raw TPS sensor signal > 4.70 V	Ignition in Unlock/accessory, run, crank Ignition Voltage > 5.23 V No PCM processor DTCs No 5VR DTCs	15/35 Cts 10 Cnts Continuous 12.5 ms / Ct in the MCP	DTC Type A MIL

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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	P0300 P0301 P0302 P0303 P0304	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% Misfire Catalyst Damage Threshold = 5% - 22.5% Misfire depending on engine speed and engine load.	• Engine run time > 1 engine cycle • DTCs not active for VSS, CKP, TP, MAP, ECT, MAF, ETC, PCM, CMP, Fuel Sensing, Throttle Actuator and IAT sensors. • Crankshaft Position System Variation must be learned or Engine speed < 1000 RPM. • Fuel cutoff not active. • Power management is not active. • Brake torque management not active. • Drag Control not active. N/A • Fuel level > 2.5%. Disablement ends 88 engine cycles, after a low fuel level condition ceases, and fuel disable does not occur with a fuel sensor DTC. • -7 °C < ECT < 125°C. • If ECT at startup < -7 °C, then disable until ECT > 21 °C. • 450 RPM < Engine speed < 6200 RPM. • 9 volts < System voltage < 18 volts. • + Throttle position delta < 20% per 100 ms. • - Throttle position delta < 20% per 100 ms. • Abnormal engine speed is not present. • Excess Engine Acceleration is not present. • No rough road. • TCS is not active. • Positive and zero torque. • Detectable engine speed and engine load region. • EGR Intrusive test not active. N/A • AIR Intrusive test not active. N/A • CAM sensor is in sync with CKP sensor. N/A • Misfire Diag is not requesting to disable TCC when transmission is in hot mode. • Crankshaft Ring Filter inactive (after a low level misfire, another misfire may not be detectable until crankshaft ringing 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 subsequent Catalyst Exceedences = (1) 200 revolution block with catalyst damage. Failure reported with (3) Exceedences in FTP, or (1) Exceedence outside FTP. Frequency: Continuous	DTC Type B
Crankshaft Position System Variation Not Learned	P0315	The DTC will determine if the Crankshaft Position System Variation has not been learned.	Sum of compensation factors between 65404 and 65667	PCM state = run Manufacturers enable counter must be Zero.	0.50 sec 100ms loop continuous	DTC Type A
Knock Sensor Circuit	P0325	rationality	Knock sensor average voltage > 4.9V or < 0.01V	Engine Speed > 1800 rpm Air per Cylinder (load) > 65g	60 failures out of 80 samples frequency: 100ms cont.	DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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 Excessive Spark Retard	P0326	performance check	Knock total retard > a value (MAP, RPM)	Knock detection = enabled Engine Speed > 1800 rpm MAP > 55 kpa	60 failures out of 80 samples frequency: 100ms cont.	DTC Type B
Knock Sensor Circuit Low Voltage - Bank 1	P0327	range check	Knock sensor max cylinder voltage – min cylinder voltage < 0.0586V	Engine Speed > 1800 rpm Air per Cylinder (load) > 65g	60 failures out of 80 samples frequency: 100ms cont.	DTC Type B

Crankshaft Position Sensor-A Circuit	P0335	CKP Time Without Match Test:
		Excessive time without CKP sensor Match
		(CKP Circuit Diagnostic)
			CKP Time Without Match Test:
			See 'TIME LENGTH AND FREQUENCY' column
				CKP Time Without Match Test:
				IF[(Engine_Running = TRUE OR Engine_Cranking = TRUE) AND
				(Engine_Speed_Defaulted < 2000) AND
				{(Starter Motor Is Engaged = TRUE AND Cranking MAF ≥ 0) OR (Engine Running MAF ≥ 3) }]
				THEN
				ENABLE DIAGNOSTIC
				ELSE
				DISABLE DIAGNOSTIC
				ENDIF
					CKP Time Without Match Test:
					Fail Report During Engine Crank = Match has not occurred within the last 4 seconds.
					Fail Report During Engine Run = Match has not occurred within the last 2 seconds
						DTC Type B

Crankshaft Position Sensor-A Performance	P0336	CKP Excessive Resyncs Test:
		Excessive number of CKP Resyncs
			CKP Excessive Resyncs Test:
			See 'TIME LENGTH AND FREQUENCY' column
				CKP Excessive Resyncs Test:
				IF[Engine_Running = TRUE OR Engine_Cranking = TRUE]
				THEN
				ENABLE DIAGNOSTIC
				ELSE
				DISABLE DIAGNOSTIC
				ENDIF
					CKP Excessive Resyncs Test:
					Fail Report = 4 CKP Resyncs occur within 5 seconds
						DTC Type B

Camshaft Position Sensor-A Bank-1 Circuit	P0340	Detects CMP sensor circuit malfunctions by monitoring for the absence of CMP sensor pulses
		(CMP sensor Circuit Diagnostic)
			See 'TIME LENGTH AND FREQUENCY' column	IF MAF ≥ 0 AND
				Engine_Running = TRUE
				MAP > 45 KPA
				No crank sensor DTCs failed this key cycle
				No MAP DTCs active
				THEN
				ENABLE DIAGNOSTIC
				ELSE
				DISABLE DIAGNOSTIC
				ENDIF
					Fail Report = 1 sensor pulse does NOT occur within
					3 Seconds
						DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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

Camshaft Position Sensor-A Bank-1 Performance	P0341	Detects CMP sensor performance malfunctions by monitoring for the incorrect number of CMP sensor pulses in a given number of CKP sensor pulses (CMP sensor Performance Diagnostic)	After Engine Start (CMP Slow Event Based Test):
			Number-of-CMP-pulses < 80
			OR > 120
				After Engine Start (CMP Slow Event Based Test) :
				IF[
				CKP_MedRes_Active = TRUE AND
				Crank_Sync_Flag = Crank_In_Sync
				No CAM circuit DTCs active
				MAP > 45 KPA
				No MAP DTCs active
				THEN
				ENABLE DIAGNOSTIC
				ELSE
				DISABLE DIAGNOSTIC
				ENDIF
				
				Footnote = The CKP_MedRes_Counter increments when the diagnostic is enabled and counts the number of CKP MedRes software interrupts. ECM thru-put prohibits interrupting on every CKP sensor pulse. Typical CKP MedRes software interrupts occur twice per cylinder, but varies in each engine
					After Engine Start (CMP Slow Event Based Test):
					One Test = 1200 MedRes software interrupts (Footnote).
					Fail Report = 8 Failed-Tests out of the last 10 Tests
					
					Footnote = CKP MedRes software interrupts occur in a certain number of CKP sensor pulses. ECM thru-put prohibits interrupting on every CKP sensor pulse. Typically occurs twice per cylinder, but each engine varies.
						DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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 ≥ .0.065 sec OSC Time Difference = OSC Worst Pass Thresh - OSC Compensation Factor * (Post Cat O2 Resp Time - Pre Cat O2 Resp Time) OSC Worst Pass Thresh = 1.5 sec	Trip Enable Criteria • • No Misfire, ECT, VSS, Fuel Trim, TPS, IAC, MAP, IAT, MAF, O2 Sensor, Purge System DTC's • No ECT DTC's • No VSS DTC's • No Fuel Trim DTC's • No TPS DTC's • No IAC DTC's • No MAP DTC's • No IAT DTC's • No MAF DTC's • No O2 Sensor DTC's • No Purge System DTC's Valid Idle Period Criteria • Engine Speed ≥ 950 rpm for minimum of 35 sec since end of last idle period • Engine Runtime ≥ 600 sec • Vehicle Speed ≤ 4 mph Test Enable Conditions • Closed loop fuel control • Fan clutch is stable • A/C clutch is stable • No other intrusive diagnostics running • 535 °C ≤ Predicted Catalyst Temperature ≤ 675 °C • Barometric Pressure ≥ 72 kPa • -20 °C < IAT< 80 °C • 69 ≤ ECT ≤ 125 °C • System Voltage > 9 V • 0 < Idle Time ≤ 60 sec ⇒ Idle Time is incremented if: Vehicle Speed < 4 mph & Throttle Position (without IAC) ≤ 5 % • 2 ≤ Airflow ≤ 12 grams per second • Delta Throttle Position (with IAC) ≤ 15 % • Load Change ≤ 6.5 % • .85 ≤ Short Term Integrator Multiplier ≤ 1.15 • Delta Engine Speed ≤ 80 RPM • HO2S (bank1 sensor1) RtoL+LtoR transitions (450mv transition pt.) ≥ 4 • (Actual Actual Engine Speed - Desired Engine Speed) ≤ 100 rpm • (Desired Engine Speed - Actual Engine Speed) ≤ 150 rpm • CCP DC Multiplier ≤ 1 • Fuel Ethanol Percent ≤ NA • Tests Attempted this idle period < 1 Green Converter Delay Criteria • Predicted catalyst temperature ≥ 500 °C for 3600 sec (non-continuously) when vehicle is new. The diagnostic will not be enabled until the next ignition cycle after this criteria has been met. In addition, all other enable criteria must be met on the next ignition cycle for the test to run on that ignition cycle. • Note: This feature is only enabled when the vehicle is new and cannot be enabled in service. Rapid Step Response Enable Criteria - OSC Time Difference Step ≥ 0.211 sec - OSC Time Difference ≥ 0 sec	1 test attempted per valid idle period Minimum of 1 test per trip. Rapid Step Response Maximum of 6 tests per trip. Maximum of 18 tests to detect failure when Rapid Step Response is enabled Frequency: Execution Rate 12.5 ms	DTC Type A

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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 System Leak Detection (Small Leak)	P0442	This DTC will detect a small leak (>= 0.020") in the EVAP system between the fuel fill cap and the purge solenoid. The DTC will also be set if the fuel tank vacuum sensor is out of range when it tries to re-zero prior to test phase-1 or test phase-2. The DTC will also be set if the refueling rationality test is failed.	SMALL LEAK TEST FAIL: Engine Off Natural Vacuum The total pressure change achieved during the test is normalized against a target value = 1.5" water). The normalized value is entered into EWMA (with 0= perfect pass and 1=perfect fail). Once EWMA exceeds the fail threshold, the DTC light is illuminated. The DTC light can be turned off if the EWMA falls below the re-pass threshold for 3 consecutive trips. Fail threshold = 0.489 Re-Pass threshold = 0.349 Vacuum sensor out of range <1.2 volts or >1.8 volts. Vacuum sensor out of range is reported as a perfect fail to the EWMA.	TEST ENABLE : VS Sensor DTC's not active Coolant Sensor DTC's not active IAT Sensor DTC's not active EVAP Vac Sensor Performance DTC not active. EVAP CCP stuck open DTC not active. EVAP large leak DTC not active. Ignition off timer DTC not active. 15.0% < Fuel Level < 85.0% Valid Cold Start 4°C < ECT < 30° C 4°C < IAT < 30° C Cold Temp Δ°C(ECT-IAT) < 8°C if ECT > IAT BARO > 74.0 kPa 2°C < Estimated ambient temp. at end of drive < 32°C. Drive time >= 10 minutes. Drive length >= 5 km. Coolant >= 70°C. No fuel filling (fuel level increment >= 10%).	Once per cold start, during hot soak (up to 2500 sec.). Time since last complete test >= 17 hours if EWMA is passing, or >= 10 hours if EWMA is failing. No more than 2 attempts per day.	DTC Type A EWMA
Canister Purge Circuit Fault	P0443	This DTC checks the canister purge solenoid circuit for electrical integrity	Output state invalid		100 failures out of 120 samples frequency: 100ms cont.	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 filter, vent hose or canister.	EXCESS VACUUM TEST - STAGE I : Vent solenoid commanded OPEN Fuel Tank Vacuum ≥ 8 in. H_2O for 2 seconds(monitored during initial purge ramp) OR EXCESS VACUUM TEST - STAGE II : Vent solenoid commanded OPEN during normal purge. Fuel Tank Vacuum ≥ 10.0 in. H_2O for a time ≥ 5 seconds OR Vented Vacuum =< -2.5 in. H_2O or Vented Vacuum => 5.0 in H_20 For 3 seconds after cold-start key-up.	TEST ENABLE : MAP DTC's not active Volt-DTC's not active TP Sensor DTC's not active VS Sensor DTC's not active Coolant Sensor DTC's not active O2 Sensor DTC's not active IAT Sensor DTC's not active 15.0% < Fuel Level < 85.0% 10V < System Voltage < 18V COLD START TEST: 4°C < ECT < 30° C 4°C < IAT < 30° C Cold Temp Δ°C(ECT - IAT)<8°C if ECT > IAT BARO > 74.0 kPa	EXCESS VACUUM TEST - STAGE II : 180 seconds Once per cold start at: • Power-up • Excess Vac. Stage I • Excess Vac. Stage II Test must complete within 675 seconds from when vehicle is started	DTC Type B
Fuel Tank Vent Circuit Fault	P0449	This DTC checks the canister purge solenoid circuit for electrical integrity	Output state invalid		100 failures out of 120 samples frequency: 100ms cont.	DTC Type B

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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. Fuel Tank Pressure Sensor Circuit Low Voltage	P0452	This DTC will detect a vacuum sensor stuck low	tank vacuum raw voltage < 0.1 volt for 5 seconds	runs continuously after a 1 second delay for sensor warm-up		DTC Type B
Evap. Fuel Tank Pressure Sensor Circuit High Voltage	P0453	This DTC will detect a vacuum sensor stuck hi	tank vacuum raw voltage >4.90 volt for 5 seconds	runs continuously after a 1 second delay for sensor warm-up		DTC Type B
Evap. Emission Control System - Malfunction	P0455	This DTC will detect a weak vacuum condition (large leak or restriction) in the EVAP. system.	WEAK VACUUM TEST- STAGE I (Cold Test): Tank Vacuum < 8 in. H_2O after the displaced purge volume has reached 5 liters. WEAK VACUUM TEST- STAGE II PASS CRITERIA(Warm Test): Stage I test failed previous trip and this trip. Passes if Tank Vac. > 8 in. H_2O for 5 seconds Note: Stage II can only report a pass	TEST ENABLE : MAP DTC's not active Volt-DTC's not active TP Sensor DTC's not active VS Sensor DTC's not active O2 Sensor DTC's not active Coolant Sensor DTC's not active IAT Sensor DTC's not active 15.0% < Fuel Level < 85.0% Power-up Vacuum Test Fail = False 10V < System Voltage < 18V COLD START TEST: 45°C < ECT < 30° C 4°C < IAT < 30° C Cold Temp Δ°C(ECT – IAT)<8°C if ECT > IAT BARO > 74.0 kPa	WEAK VACUUM TEST- STAGE I (Cold Test): Test must complete within 675 seconds after the vehicle is started. WEAK VACUUM TEST- STAGE II (Warm Test): Fault present for a time ≥ 1300 sec. This is the maximum test time length. Once per cold start	DTC Type B
Engine Cooling Fan Relay 1 Control Circuit	P0480	This DTC checks the Engine cooling fan relay 1 circuit for electrical integrity	Output state invalid	11V < System Voltage < 18 V Engine Speed > 425 RPM	100 failures out of 120 samples frequency: 100ms cont.	DTC Type B
Engine Cooling Fan Relay 2 Control Circuit	P0481	This DTC checks the Engine cooling fan relay 2 circuit for electrical integrity	Output state invalid	11V < System Voltage < 18 V Engine Speed > 425 RPM	100 failures out of 120 samples frequency: 100ms cont.	DTC Type B
Evap. Emission Control System - Continuous Open Purge Flow	P0496	This DTC will determine if the purge solenoid is leaking to engine manifold vacuum.	PURGE VALVE LEAK TEST: Purge valve closed Fuel Tank Vacuum > 4.5-6" H2O for 5 seconds before purge time > 60 sec (Fuel Tank Vacuum level dependent on fuel level)	TEST ENABLE: No IAT DTC's active No MAP DTC's active No TPS DTC's active No Vehicle Speed sensor DTC's active No ECT sensor DTC's active No EVAP output circuit DTC's active No Fuel Tank Pressure Sensor DTC's active DTC P0125 not active 15 % < Fuel Level < 85 % 10 V < System Voltage < 18 V COLD START TEST: 3.75°C < ECT < 30° C 3.75°C < IAT < 30° C Cold Temp Δ°C(ECT - IAT)<8°C if ECT > IAT BARO > 74.0 kPa	Once per trip. Max engine run time is 65 sec	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
Idle System Low	P0506	functional check	Idle rpm > 75 rpm below desired rpm based on coolant temperature.	General Test Enable: No MAF DTC's. No MAP DTC's. No IAT DTC's. No ECT DTC's No TP sensor DTC's. No injector fault DTC's. No VS sensor DTC's. No EGR pintle pos. DTC. No purge flow DTC's. No crank sensor DTC's. 11 volts < System volt < 18 volts. IAT > -7 °C BARO > 75 kPa ECT > -7°C Engine run time > 40 sec. Closed loop fueling enabled Idle test: General conditions met. Idle conditions present > 2 seconds Time since a transition to or from park/neutral > 3 sec.. Time since TCC mode change > 3 sec.	3 failed tests required to set fault 5 seconds per test frequency: 250 ms cont.	DTC Type B
Idle System High	P0507	functional check	Idle rpm > 150 RPM above desired RPM based on coolant temperature.	General Test Enable: No MAF DTC's. No MAP DTC's. No IAT DTC's. No ECT DTC's No TP sensor DTC's. No injector fault DTC's. No VS sensor DTC's. No EGR pintle pos. DTC. No purge flow DTC's. No crank sensor DTC's. 11volts < System volt < 18 volts. IAT > -7 °C BARO > 75 kPa ECT > -7°C Engine run time > 40 sec. Closed loop fueling enabled Idle test: General conditions met. Idle conditions present > 2 seconds Time since a transition to or from park/neutral > 3 sec.. Time since TCC mode change > 3 sec.	3 failed tests required to set fault 5 seconds per test frequency: 250 ms cont.	DTC Type B
PCM Memory	P0601	functional check	Computed EPROM checksum not equal to expected	None	1 failure during the first execution 5 failures thereafter Background loop cont.	DTC Type A

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
PCM not Programmed	P0602	functional check	Calibration parameter not equal to expected value	None	1 failure 250 ms cont.	DTC Type A
PCM Memory - RAM	P0604	functional check	Bad RAM location found		100 failure if found during first test in ignition cycle. 2 failures if found during subsequent tests in the ignition cycle. Continuous	DTC Type A

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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
1. Processor Performance Check - Throttle limiting Fault (MCP) 2. Processor Performance Check - ETC software is not executed in proper order 3. Processor Performance Check 4. Processor Performance Check - SPI failed 5. Processor Performance Check - MCP state of health (Main) 6. Processor Performance Check - Learn Corruption Fault (Main&MCP) 7. Processor Performance Check - Learn Corruption Fault MAIN & MCP 8. Processor Performance Check - MCP state of health (Main) 9. Processor Performance Check - MAIN state of health (MCP)	P0606	Indicates that the ECM has detected an ETC internal processor integrity fault	1. MCP desired throttle limiting occurring 2. ETC software is not executed in proper order 3. Software tasks loops > schedule tasks loop 4. Loss of SPI communication from the MCP 5. Average MCP SOH toggle 1.5 ms < x < 2.5 ms 6. TPS or APPS minimum learned values fail compliment check 7. TPS or APPS minimum learned values fail range check 8. MCP integrity check error occurs 9. MCP integrity check error of main µP occurs	Ignition in unlock/accessory, run or crank Ignition Voltage>5.23 V	1. 99 Cnts continuous, 2 ms /Ct in the MCP 2. 1 Cnt continuous, 12.5 ms / Cnt in the main µP 3. Error > 3 Cnts, 100ms/ Cnt in the main µP 4. 160/400 Cts or 15 Cnts continuous, 39 Cnts continuous @ init., 12.5 ms / Ct in the main µP 5. 3 Cnts continuous, 50 ms / Cnt in the main µP 6. 100 ms in the main µP. 7. 10 ms in the main µP. 8. 4 Cnt Continuous, 50 ms / Ct in the main µP 9. 2 Cnt Continuous, 12.5 ms/Ct in the main MCP	DTC Type A MIL

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
5 Volt Reference 1 Circuit	P0641	Detects a continuos or intermittent short on the #1 5 Volt Sensor Reference Circuit	Vref1 voltage -Vcc voltage > 0.125 V OR Vcc voltage -Vref1 voltage > 0.175 V	Ignition in unlock/accessory, run or crank Ignition Voltage > 5.23 V No ECM processor DTC	20/40 CTS or 200 ms continuous 12.5 ms/Ct in main µP 125/250 Cts or 99Cts continuous 2 ms/Ct in MCP µP	DTC Type A MIL
Malfunction Indicator Lamp (MIL) Control Circuit	P0650	This DTC checks the Malfunction Indicator Lamp circuit for electrical integrity	Output state invalid		100 failures out of 120 samples frequency: 100ms cont.	DTC Type B
5 Volt Reference 2 Circuit	P0651	Detects a continuos or intermittent short on the #2 5 Volt Sensor Reference Circuit	Vref2 voltage -Vcc voltage> 0.125 V OR Vcc voltage –Vref2 voltage > 0.175 V	Ignition in unlock/accessory, run or crank Ignition Voltage > 5.23 V No ECM processor DTC	20/40 CTS or 200 ms continuous 12.5 ms/Ct in main µP 125/250 Cts or 99Cts continuous 2 ms/Ct in main µP	DTC Type A MIL
Intake Rationality Cross-check Out of Range	P1101	This DTC determines if there are multiple air induction system problems affecting airflow and/or manifold pressure.	Filtered throttle error > 230 kPa grams per second and Filtered manifold pressure 2 error > 20 kPa and [Filtered manifold pressure 1 error > 20 kPa or Filtered airflow error > 10 grams per second]	No MAF circuit DTCs set No MAP circuit DTCs set No EGR DTCs set No ECT circuit DTCs set No IAT circuit DTCs set No CKP DTCs set 400 RPM < Engine Speed < 6400 RPM 70°C < Engine Coolant Temperature < 125°C -7°C < Intake Air Temperature < 125°C	Immediate Frequency: 12.5 ms 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
HO2S Circuit Insufficient Switching (bank 1 sensor 1)	P1133	This DTC determines if the O2 sensor functioning properly by monitoring the number of L/R and R/L switches. Half cycle (HC) switch count is reported if a minimum number of slope time (ST) Switches are counted.	Slope Time L/R switches < 2 OR Slope Time R/L switches < 2 OR Half Cycle L/R switches < 50 OR Half Cycle R/L switches < 50 O2 voltage between 500 millivolts and 600 millivolts	No misfire DTC's No injector DTC's No MAF DTC's No ETC DTCs No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No ECT sensor DTC's No Bank 1 Sensor 1 Voltage DTC's No O2 Heater Circuit DTC Catalyst diagnostic test not active Closed Loop Fuel Enabled 11 volts < Ignition Voltage < 18 volts Engine Run Time > 200 sec. Coolant temp > 70 C 1000 RPM < Engine Speed < 3500 RPM 15.0 grams per second < MAF < 50 grams per second Throttle position ≥ 5 % Transmission not in Park, Reverse or Neutral Above conditions met for 2.0 seconds.	60 seconds of response data after enable Once per key cycle	DTC Type B
Throttle Actuator Control (TAC) Module - Throttle Actuator Position Performance	P1516	1. Detect a throttle positioning error. 2. Detect a throttle positioning error. 3. Detect excessive current draw on the actuator circuit. 4. Determine if the actuator has been miswired.	1. |throttle error| >= |2%| after > 5 second stability with no change in error sign, after 4 second stable command. 2. |throttle error| > 10% 3. I(actuator) > 9A 4. TPS1< 2.36V	1-3. Ignition in run or crank [RPM>0 or (RPM=0 and not in battery saver mode)]. No airflow actuation DTC. No throttle actuation DTC. Engine running=true or Ignition voltage > 6.5 V 4. Minimum TPS learn active state	1. 249 Cnts continuous 2 ms/ Ct in the MCP 2. 99 Cnts continuous 2 ms/ Ct in the MCP 3. 50 Cnts continuous 2 ms/ Ct in the MCP 4. 99 Cnts continuous 2 ms/ Ct in the MCP	DTC Type A MIL
PCM - EEPROM General Failure	P1621	Checks for a write error	Incorrect Checksum	Ignition in Unlock/Accessory, Run, or Crank. Ignition voltage > 5.23 V	Immediately on next key up if flagged on previous key down Once at key down	DTC Type A

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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
Control Module Accelerator Pedal Position (APP) System Performance	P1680	1. Verify the PCM´s ability to detect a short between the APPS 1 & 2 circuits 2. Verify that the indicated accelerator pedal position calculation is correct.	1. APPS #2 signal voltage > 2.05V 2. Difference between Main µP indicated accelerator pedal position and MCP indicated accelerator pedal position > 0V	1. Ignitions in unlock/ accessory and run, not during TPS minimum learn active during intrusive portion of diagnostic execution. Ignition Voltage > 5.23 V No PCM processor DTC 2. Ignition in unlock, accessory, run or crank Ignition Voltage > 5.23 V No PCM processor DTC	1. 2 Cts, 156.25 ms w/immediate retest on an error, performed in the Main µP 2. 99 Cnts continuous, 12.5 ms / Ct in the MCP	DTC Type A MIL
Control Module Throttle Position (TP) System Performance	P1681	1. Verify the PCM´s ability to detect a short between the TPS 1 & 2 circuits 2. Verify that the throttle control system position sensor short diagnostic is functioning.	1. TPS #2 Signal voltage>2.05 V 2. No detection of the sensor short diagnostic active state	Ignition voltage > 5.23 V No PCM processor DTC. Ignition in unlock/accessory or run, not during TPS minimum learn active during intrusive portion of diagnostic execution	1. 2 cts, 156.25 ms w/immediate retest on an error, performed in the main µP 2. No sensor short diagnostic activity for 498 ms. Detected by the MCP	DTC Type A MIL

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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
Control Module Throttle Actuator Position Performance	P2101	Detect a throttle positioning error	Difference between measured throttle position and modeled throttle position > 10%	Ignition in run or crank [RPM>0 or (RPM=0 and not in battery saver mode)]. No airflow actuation DTC. No throttle actuation DTC. Engine running=true or Ignition voltage > 8 V	Positive error counter: increments by 3 if t.e.> 10% decrements by 2 if 0%<t.e.<10% decrements by 2 if -10%<t.e.<0%; clears if t.e.< -10%. Negative error counter: increments by 3 if t.e.< -10% decrements by 2 if -10%< t.e.< 0% decrements by 2 if 0%< t.e. < 10% clears if t.e. > 10%. Thresholds are 45 Check runs every 12.5 ms in the Main µP	DTC Type A MIL
Accelerator Pedal Position (APP) Sensor 1	P2120	Detect a continuous or intermittent short or open in the APP sensor #1.	Raw APP sensor signal is < 0.75 V OR > 4.65V	Ignition in unlock/ accessory, run or crank. Ignition voltage >5.23 V No PCM processor DTCs No 5VR DTCs	20/40 Cts or 10 Cnts continuous 12.5 ms /Ct in the main µP 92/217 Cts or 67 Cnts continuous 2 ms/Ct in the MCP	DTC Type A MIL
Accelerator Pedal Position (APP) Sensor 2 Circuit	P2125	Detect a continuous or intermittent short or open in the APP sensor #2.	Raw APP sensor signal is < 0.75 V OR > 4.65V	Ignition in unlock/ accessory,run or crank. Ignition voltage >5.23 V No PCM processor DTCs No 5VR DTCs	15/35 Cts or 10 Cnts continuous 12.5 ms / Ct in the main µP 92/217 Cts or 67 Cnts continuous 2 ms/Ct in the MCP	DTC Type A MIL
Throttle Position (TP) Sensor 1-2 Correlation	P2135	Detects a continuous or intermittent correlation fault between TP sensors #1 and #2	Difference between (raw min. learned TPS#1 voltage-raw min. TPS#1 voltage) and (raw TPS#2 voltage - raw min. learned TPS#2 voltage) < 6.54% offset at min. throttle position with an increasing to 10% at max. throttle position	Ignition in unlock/accessory, run or crank. Ignition voltage >5.23 V No PCM processor DTCs No TP Sensor Circuit DTCs,	15/35 Cts or 12 Cnts Continuous 12.5 ms/Ct in the Main µP 92/217 Cts or 67 Cnts Continuous 2 ms/Ct in the MCP	DTC Type A MIL

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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
Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138	1. Detect an invalid minimum mechanical position correlation between APP sensor #1 and #2 2. Detect a short between APP sensors #1 and #2 circuits.	1. Differnece between (5V-raw learned min. APPS#2 voltage)*2 and (raw learned min. APPS#1 voltage) > 0.25 V at min throttle position to 0.5 V at max throttle position 2. Difference between APP#1 and APP#2 < 1 V	1. Ignition in unlock/accessory, run or crank. Ignition voltage >5.23 V No PCM processor DTCs No APP Sensor Circuit DTCs No 5VR DTCs 2. Ignition in unlock/ accessory, run or crank. Ignition voltage >5.23 V No PCM processor DTCs.	1. 15/35 Cts or 12 Cnts Continuous, 12.5 ms/Ct in the Main µP 92/217 Cts or 80 Cnts Continuous, 2 ms/Ct in the MCP 2. 2 Cts 156.25 ms w/ immediate test on an error, performed in the main µP.	DTC Type A MIL
Minimum Throttle Position Not Learned	P2176	Throttle position minimum learning not completed	Throttle Position > 0.82 V	Minimum TPS learn active state. Stable throttle position reading for 40 ms. Ignition in run or crank. No TP Sensor Circuit DTCs	3 seconds	DTC Type A MIL

2004 *Malibu*, with 2.2L (L61), and 2.0L (LSJ) *supercharged, ION Redline & Cobalt SS*
ENGINE DIAGNOSTIC PARAMETERS

2004file15.doc

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
Control Module Ignition Off Timer Performance	P2610	This DTC determines if the ignition off timer has failed.	1. A failure will be reported if the following occurs 3 times: Ignition Off Time < 0 Or Ignition Off Time > 10 2. A failure will be reported if any of the following occur 15 times out of 20 tests: Time since last ignition off timer increment > 1.39375 Current Ignition Off Time < Old Ignition Off Time Time between ignition off timer increments < .575 Time between ignition off timer increments > 1.39375 Current Ignition Off Time - Old Ignition Off Time =1	Test Run This Trip = FALSE Ignition Off Timer Enabled = TRUE -40 < Intake Air Temperature < 125	Frequency: 100 ms loop Continuous	DTC Type B