1996 4.3L (L99) B-car Engine Diagnostic Parameters

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SENSED PARAMETER	FAULT CODE	SENSOR SIGNAL TYPE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	MONITORING METHOD	FAULT CODE STORAGE AND MIL ILLUMIN. (A,or B)
MASS AIR FLOW SYSTEM CKT MALF (STATIC FREQ.)	P0100	Frequency	0.5 kHz - 12 kHz The frequency should vary slightly between reads of the sensor. If the frequency does not vary (static air flow), a faulty Mass Air Flow condition exists.	Mass Air Flow frequency delta < 2 counts between reads for 4 consecutive reads.	RPM > 50 Syst. Voltage > 10 volts	4 Consecutive Reads Reference interrupt loop continuous	Hot wire current differential	DTC Type A
MASS AIR FLOW SYSTEM PERFORMANCE (RATIONALITY)	P0101	Frequency	0.5 kHz - 12 kHz Under conditions when the two should match, the Mass Air Flow reading should match calculated Mass Air Flow (based on speed density). If delta Mass Air Flow is too large, a faulty Mass Air Flow condition exsists.	Mass Air Flow frequency > 40% different from speed density calculation at low flow conditions, to > 25% different at higher flow conditions.	Engine Speed < 2800 rpm, System Voltage >10 volts, TP > 16%.	100 msec	Hot wire current differential	DTC Type A
MASS AIR FLOW SENSOR CKT LOW FREQUENCY	P0102	Frequency	0.5 kHz - 12 kHz Detects Mass Air Flow frequecny readings outside normal operating range. If the frequency outside a calibrated range, a faulty Mass Air Flow condition exists.	Mass Air Flow frequency < 1000 hz.	Engine Speed > 50 RPM and System Voltage > 10 volts. Above conditions met for > = 1.0 second.	20 test failures within a 50 test sample .Reference interrupt loop continuous	Hot wire current differential	DTC Type A
MASS AIR FLOW SENSOR CKT HIGH FREQUENCY	P0103	Frequency	0.5 kHz - 12 kHz Detects Mass Air Flow frequecny readings outside normal operating range. If the frequency outside a calibrated range, a faulty Mass Air Flow condition exists.	Mass Air Flow frequency > 10,700 hz.	Engine Speed > 50 RPM and System Voltage > 10 volts. Above conditions met for > = 1.0 second.	20 test failures within a 50 test sample .Reference interrupt loop continuous	Hot wire current differential	DTC Type A
MANIFOLD ABSOLUTE PRESSURE SYSTEM PERFORMANCE	P0106	Analog	0.3 V to 5.0 V; A change in MAP must be preceded by a significant change in RPM, throttle angle, EGR flow rate and idle air value. If not, a faulty MAP condition such as a out of range sensor exists.	Raw MAP delta > 0.54 Volts within 12.5 ms	AC Clutch/Brake Sw/Clutch Sw/Power Steering Sw = no change Engine Running No TP, MAP DTC's set Traction Control Inactive Engine Speed delta < 100 RPM TPdelta < 5% EGR Flow Rate delta < 25% Idle Air delta < 5 counts All met for 0.5 seconds	480 test failures within a 650 test sample after 2 consecutive trips. Every MAP read	Pressure Differential Sensor	DTC Type B
MANIFOLD ABSOLUTE PRESSURE SENSOR CKT LOW	P0107	Analog	0.3 V to 5.0 V; This DTC detects a continuous short to low or open in either the signal circuit or the MAP sensor.	Raw MAP < 0.52 Volts	No TP sensor DTC's set Throttle Position > = 15%	480 test failures within a 650 test sample after 2 consecutive trips. Every MAP read	Pressure Differential Sensor	DTC Type B
MANIFOLD ABSOLUTE PRESSURE SENSOR CKT HIGH	P0108	Analog	0.3 V to 5.0 V; This DTC detects a continuous short to high in either the signal circuit or the MAP sensor.	Raw MAP > 4.24 Volts	No TP sensor DTC's set Engine Running Throttle Position is < = 0% when Engine speed is < = 1000 RPM or Throttle Position is < = 3 % when Engine speed is > 1000 RPM	45 test failures within a 50 test sample after 2 consecutive trips. Every MAP read	Pressure Differential Sensor	DTC Type B
INTAKE AIR TEMP SENSOR CKT LOW (HIGH TEMP)	P0112	Analog	0.24 V to 5.0 V; This DTC detects a continuous short to ground in the IAT signal circuit or the IAT sensor	Low, High Resistance Pullup Raw IAT < 0.46 Volts	No MAF sensor DTC's set No ECT sensor DTC's set No VS sensor DTC's set Vehicle Speed > = 25 mph Engine Run Time > 30 seconds	45 test failures within a 50 test sample after 2 consecutive trips. Every 100 ms	Thermistor	DTC Type B
INTAKE AIR TEMP SENSOR CKT HIGH (LOW TEMP)	P0113	Analog	0.24 V to 5.0 V; This DTC detects a continuous open or short to high in the IAT signal circuit or the IAT sensor	Low, High Resistance Pullup Raw IAT > 4.96 Volts	No MAF sensor DTC's set No ECT sensor DTC's set No VS sensor DTC's set Coolant Temperature > 0 deg. C Air Flow < 15 g/sec Vehicle Speed < 7 mph	45 test failures within a 50 test sample after 2 consecutive trips. Every 100 ms	Thermistor	DTC Type B

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ENGINE COOLANT TEMP SENSOR CKT LOW (HIGH TEMP)	P0117	Analog	0.24 V to 5.0 V; This DTC detects a continuous short to ground in the ECT signal circuit or the ECT sensor.	Low Resistance Pullup Raw ECT < 1.12 Volts High Resistance Pullup Raw ECT < 0.57 Volts	Engine run time > 20 seconds	45 test failures within a 50 test sample after 2 consecutive trips. Every 100 ms	Thermistor	DTC Type B
ENGINE COOLANT TEMP SENSOR CKT HIGH (LOW TEMP)	P0118	Analog	0.24 V to 5.0 V; This DTC detects a continuous short to high or open in the ECT signal circuit or the ECT sensor.	Low, High Resistance Pullup Raw ECT > 4.9 Volts	Engine run time > 20 seconds	45 test failures within a 50 test sample after 2 consecutive trips. Every 100 ms	Thermistor	DTC Type B
THROTTLE POSITION SENSOR CKT PERFORMANCE (STUCK)	P0121	Analog	0.5v - 5v Detects a stuck TP sensor	Last throttle position value > predicted throttle position based on engine RPM	Engine Running MAP < 60 kPa TP delta < 1.2%	384 failures in sample of 512 Continuous	Potentiometer	DTC Type B
THROTTLE POSITION SENSOR CKT LOW	P0122	Analog	0.5v - 5v Detects a continuous short to low or ground in the signal circuit or the TP sensor	Raw TP sensor signal < 10 A/D counts (0.18 volts)	Ignition On.	90 failures in a sample of 100 Continuous	Potentiometer	DTC Type A
THROTTLE POSITION SENSOR CKT HIGH	P0123	Analog	0.5v - 5v Detects a continuous short to high in the signal circuit or the TP sensor	Raw TP sensor signal > 245 A/D counts (4.7 volts)	Ignition On.	90 failures in a sample of 100 Continuous	Potentiometer	DTC Type A
ENGINE COOLANT TEMP EXCESSIVE TIME TO CLOSED LOOP	P0125	Analog	0.24 V to 5.0 V; This DTC detects if a stabilized minimum closed loop is reached and maintained after engine startup.	Minimum stabilized ECT < 60 deg. C. When IAT <Threshold OR ECT < 30 to 40 deg. C When IAT > Threshold	Engine running 10 deg. C <= Start up ECT < 60 deg. C (test must run once for a hot start) No ECT, IAT DTC's set IAT >= 10 deg. C VS >= 5 mph Not in DFCO 90 sec < Closed Loop timer < 600 secs (depends on start-up temp)	2 consecutive test failures Every 100 ms	Thermistor	DTC Type B
(B1S1) HEATED OXYGEN SENSOR CKT LOW	P0131	Analog	Detects an O2 voltage stationary lean (low signal voltage)condition.	Oxygen sensor voltage below 200 mv (310 out of 330 samples and polling the rear sensor once.)	Closed Loop Fuel Control. Learn Enabled.TPS: 3- 20 %	Continous 100 msec sample / race (330) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type A
(B1S1) HEATED OXYGEN SENSOR CKT HIGH	P0132	Analog	Detects an O2 voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above775 mv (310 out of 330 samples and polling the rear sensor once.)	Closed Loop Fuel Control. Learn Enabled.TPS: 3- 20 %	Continous 100 msec sample / race (330) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type A
(B1S1) HEATED OXYGEN SENSOR CKT SLOW RESPONSE	P0133	Analog	Detects slow rich to lean and lean to rich O2 signal transition rates.	The oxygen sensor transitions between rich and lean states slows and causes and emissions shift of 1.5x 100 K standard.	Closed Loop Fuel Control. rpm and g/sec windows. ex:1000-1700,15-32 g/sec.	100 sec data collection timer during enabling conditions once per trip.	oxygen sensor signal	DTC Type B
(B1S1) HEATED OXYGEN SENSOR CKT NO ACTIVITY	P0134	Analog	Detects an O2 circuit open.	Oxygen sensor voltage remains between 352-552 mv (570 out of 600 samples).	Closed Loop Fuel Control. Predicted Oxygen Sensor Temperature greater than 430 C.	100 msec internal (600 samples) during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type A

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(B1S1) HEATED OXYGEN SENSOR HEATER CKT	P0135	Analog	Detects a malfunctioning O2 heater circuit by comparing time to O2 activity to a calibrated threshold.	Oxygen sensor time to acitivity exceeds a lookup table value as a function of average flow rate.	Cold Start. Valid mid bias calculated. System Voltage not below 9 volts for more than 40 counts.	Once during a cold start.	Wait for the oxygen sensor signal to swing through a window (+240 -150) away form a valid mid bias voltage.	DTC Type B
(B1S2) HEATED OXYGEN SENSOR CKT LOW	P0137	Analog	Detects an O2 voltage stationary lean (low signal voltage)condition.	Oxygen sensor voltage remains below 40 mv (380 out of 400 samples and polling the front sensor twice).	Closed Loop Fuel Control. Learn Enabled. TPS: 3-20 %	Continous 100 msec sample / race (400) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type B
(B1S2) HEATED OXYGEN SENSOR CKT HIGH	P0138	Analog	Detects an O2 voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 930 mv (310 out of 330 samples and polling the rear sensor once.)	Closed Loop Fuel Control. Learn Enabled. TPS: 3-20 %	Continous 100 msec sample / race (400) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type B
(B1S2) HEATED OXYGEN SENSOR CKT NO ACTIVITY	P0140	Analog	Detects an O2 circuit open.	Oxygen sensor voltage remains between 391-491 mv. (1450 out of 1500 samples).	Closed Loop Fuel Control. Predicted Oxygen Sensor Temperature greater than 430 C.	Continous 100 msec sample / race (1500) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type B
(B1S2) HEATED OXYGEN SENSOR HEATER CKT	P0141	Analog	Detects a malfunctioning O2 heater circuit by comparing time to O2 activity to a calibrated threshold.	Oxygen sensor time to acitivity exceeds a lookup table value as a function of average flow rate.	Cold Start. Valid mid bias calculated. System Voltage not below 9 volts for more than 40 counts.	Once during a cold start.	Wait for the oxygen sensor signal to swing through a window (+240 -150) away form a valid mid bias voltage.	DTC Type B
(B2S1) HEATED OXYGEN SENSOR CKT LOW	P0151	Analog	Detects an O2 voltage stationary lean (low signal voltage)condition.	Oxygen sensor voltage below 200 mv (310 out of 330 samples and polling the rear sensor once.)	Closed Loop Fuel Control. Learn Enabled.TPS: 3- 20 %	Continous 100 msec sample / race (330) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type A
(B2S1) HEATED OXYGEN SENSOR CKT HIGH	P0152	Analog	Detects an O2 voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above775 mv (310 out of 330 samples and polling the rear sensor once.)	Closed Loop Fuel Control. Learn Enabled.TPS: 3- 20 %	Continous 100 msec sample / race (330) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type A
(B2S1) HEATED OXYGEN SENSOR CKT SLOW RESPONSE	P0153	Analog	Detects slow rich to lean and lean to rich O2 signal transition rates.	The oxygen sensor transitions between rich and lean states slows and causes and emissions shift of 1.5x 100 K standard.	Closed Loop Fuel Control. rpm and g/sec windows. ex:1000-1700,15-32 g/sec.	100 sec data collection timer during enabling conditions once per trip.	oxygen sensor signal	DTC Type B
(B2S1) HEATED OXYGEN SENSOR CKT NO ACTIVITY	P0154	Analog	Detects an O2 circuit open.	Oxygen sensor voltage remains between 352-552 mv (570 out of 600 samples).	Closed Loop Fuel Control. Predicted Oxygen Sensor Temperature greater than 430 C.	Continous 100 msec sample / race (600 sample) counter during enable conditions.		
(B2S1) HEATED OXYGEN SENSOR HEATER CKT	P0155	Analog	Detects a malfunctioning O2 heater circuit by comparing time to O2 activity to a calibrated threshold.	Oxygen sensor time to acitivity exceeds a lookup table value as a function of average flow rate.	Cold Start. Max avg flow rate: 35 g/sec. Valid mid bias calculated. System Voltage not below 9 volts for more than 40 counts.	Once during a cold start.	Wait for the oxygen sensor signal to swing through a window (+240 -150) away form a valid mid bias voltage.	DTC Type B

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(B2S2) HEATED OXYGEN SENSOR CKT LOW	P0157	Analog	Detects an O2 voltage stationary lean (low signal voltage)condition.	Oxygen sensor voltage remains below 40 mv (380 out of 400 samples and polling the front sensor twice).	Closed Loop Fuel Control. Learn Enabled. TPS: 3-20 %	Continous 100 msec sample / race (400) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type B
(B2S2) HEATED OXYGEN SENSOR CKT HIGH	P0158	Analog	Detects an O2 voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 930 mv (310 out of 330 samples and polling the rear sensor once.)	Closed Loop Fuel Control. Learn Enabled. TPS: 3-20 %	Continous 100 msec sample / race (400) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type B
(B2S2) HEATED OXYGEN SENSOR CKT NO ACTIVITY	P0160	Analog	Detects an O2 circuit open.	Oxygen sensor voltage remains between 391-491 mv. (1450 out of 1500 samples).	Closed Loop Fuel Control. Predicted Oxygen Sensor Temperature greater than 430 C.	Continous 100 msec sample / race (1500) counter during enable conditions.	Fast Filtered Oxygen Sensor Signal.	DTC Type B
(B2S2) HEATED OXYGEN SENSOR HEATER CKT	P0161	Analog	Detects a malfunctioning O2 heater circuit by comparing time to O2 activity to a calibrated threshold.	Oxygen sensor time to acitlvity exceeds a lookup table value as a function of average flow rate.	Cold Start. Valid mid bias calculated. System Voltage not below 9 volts for more than 40 counts.	Once during a cold start.	Wait for the oxygen sensor signal to swing through a window (+240 -150) away form a valid mid bias voltage.	DTC Type B
BANK 1 FUEL TRIM SYSTEM LEAN	P0171	Software	Determines if the fuel control system is in a lean condition	The average of short term fuel trim samples > +7.8% and The normalized weighted long term fuel trim parameter > +21.9%	No MAF, MAP, IAT, ECT, TP, HO2S, AIR, Misfire, Injector, Distributor, IC, EVAP valve DTC's BARO > 70 KPa 115°C > ECT > 60°C 100 g/s > MAF > 5 g/s 95 Kpa >MAP > 20 KPa 100°C > IAT > -30°C 4000 rpm > Engine speed > 500 rpm TP < 75% VS < 75 mph	3 seconds Continuous	Short term fuel trim and long term fuel trim parameter and software	DTC TYPE B
BANK 1 FUEL TRIM SYSTEM RICH	P0172	Software	Determines if the fuel control system is in a rich condition	The average of short term fuel trim samples < -9.4% and The normalized weighted long term fuel trim parameter < -13.3%	No MAF, MAP, IAT, ECT, TP, HO2S, AIR, Misfire, Injector, Distributor, IC, EVAP valve DTC's BARO > 70 KPa 115°C > ECT > 60°C 100 g/s > MAF > 5 g/s 95 Kpa >MAP > 20 KPa 100°C > IAT > -30°C 4000 rpm > Engine speed > 500 rpm TP < 75% VS < 75 mph	3 seconds Continuous	Short term fuel trim and long term fuel trim parameter and software	DTC TYPE B
BANK 2 FUEL TRIM SYSTEM LEAN	P0174	Software	Determines if the fuel control system is in a lean condition	The average of short term fuel trim samples > +7.8% and The normalized weighted long term fuel trim parameter > +21.9%	No MAF, MAP, IAT, ECT, TP, HO2S, AIR, Misfire, Injector, Distributor, IC, EVAP valve DTC's BARO > 70 KPa 115°C > ECT > 60°C 100 g/s > MAF > 5 g/s 95 Kpa >MAP > 20 KPa 100°C > IAT > -30°C 4000 rpm > Engine speed > 500 rpm TP < 75% VS < 75 mph	3 seconds Continuous	Short term fuel trim and long term fuel trim parameter and software	DTC TYPE B

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BANK 2 FUEL TRIM SYSTEM RICH	P0175	Software	Determines if the fuel control system is in a rich condition	The average of short term fuel trim samples < -9.4% and The normalized weighted long term fuel trim parameter < -13.3%	No MAF, MAP, IAT, ECT, TP, HO2S, AIR, Misfire, Injector, Distributor, IC, EVAP valve DTC's BARO > 70 KPa 115°C > ECT > 60°C 100 g/s > MAF > 5 g/s 95 Kpa >MAP > 20 KPa 100°C > IAT > -30°C 4000 rpm > Engine speed > 500 rpm TP < 75% VS < 75 mph	3 seconds Continuous	Short term fuel trim and long term fuel trim parameter and software	DTC TYPE B
INJECTOR CKT MALF	P0200	Digital	Less than 1 volt to B+. Determines if an injector control circuit is malfunctioning.	Detected voltage on the control circuit near 0 volt.	Engine Speed > 600 rpm.	5 seconds. Continuous.	Control circuit fault line monitoring.	DTC TYPE A
MULTIPLE / INDIVIDUAL CYLINDER MISFIRE DETECTED Cylinder 1 Misfire Cylinder 2 Misfire Cylinder 3 Misfire Cylinder 4 Misfire Cylinder 5 Misfire Cylinder 6 Misfire Cylinder 7 Misfire Cylinder 8 Misfire	P0300 P0301 P0302 P0303 P0304 P0305 P0306 P0307 P0308	Digital	These DTC's will determine if a multiple or a cylinder specific misfire is occuring by monitoring crankshaft velocity.	Deceleration index vs Engine speed vs Load with Distributor position	No MAF DTC's No ECT DTC's No Throttle position DTC's No Crank position DTC's Engine speed > 400 rpm but < 3000 rpm System voltage > 9 volts but < 16 volts + Throttle position Δ < 6.25% / 100 ms - Throttle position Δ < 1.5% / 100 ms Not a Rough Road - ABS	5 failed 200 revolution blocks out of 16 Emission Level 1 failed 200 revolution block Catalyst damaging Level Continuous	Crankshaft position sensor and target wheel and distributor position sensor	DTC TYPE B EMISSION DTC TYPE A CATALYST DAMAGING
CRANKSHAFT POSITION SENSOR CKT MALF (CKP SEN. TO LOW RES.)	P0335	Digital	4X signal This diagnostic will detect a low duty cycle (circuit failure) from the crankshaft position sensor.	10 % < Crank sensor duty cycle < 90 %	9 Volts < Ignition Voltage < 17 Volts 500 rpm < Engine speed < 4000 rpm	25 failures within a 50 sample limit. Every 100 ms	Hall Effect Crankshaft sensor	DTC Type B
CRANKSHAFT POSITION SENSOR CKT RANGE/PERF.	P0336	Digital	4X signal This diagnostic will detect a out of range signal from the crankshaft position sensor.	58.8 % < Crank sensor duty cycle < 77.8 %	9 Volts < Ignition Voltage < 17 Volts 500 rpm < Engine speed < 4000 rpm	25 failures within a 50 sample limit. Every 100 ms	Hall Effect Crankshaft sensor	DTC Type B
DISTRIBUTOR IGNITION SYSTEM - HIGH RES PULSE LOSS	P0372	Digital	0v to 8+ digital signal. Detects a faulty high resolution cam position sensor circuit by counting the number of low resolution (4X) cam position signals without a high-res (360X) signal. If low-res signals exceed the threshold the code will set.	80 low resolution (4X) pulses without a high resolution (360) pulse.	Engine cranking or running.	80 failures within a 100 sample limit. Every 100 ms	Software	DTC Type A

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EGR SYSTEM (LOW DELTA MAP DETECTED) (where applicable)	P0400	Software	MAP change > 1 Kpa. A change in EGR flow results in a change in MAP.	The vehicle must meet stable operation criteria for 1.0 - 2.0 seconds. The EGR valve is opened or closed for 1.0 - 2.0 seconds, and the peak change in MAP is recorded. A filtered value of expected vs. actual MAP change is compared to the fail limit.	No MAP DTC's No IAT, ECT, or Throttle position DTC's No EGR vac. reg. sol. circuit DTC's MAP > 24 KPa ECT > 20°C Vehicle Speed - above 14 MPH BARO > 60 KPa Engine Speed > 500 rpm Delta Idle Control < 3 steps Delta MAP < 1 KPa before test start <u>DECEL:</u> Throttle position < 1% Engine speed > 500 but < 2000 rpm Compensated MAP > 40 KPa but < 70 KPa <u>CRUISE:</u> Throttle position > 5% but < 20% Delta Throttle < 1% Compensated MAP > 20 KPa but < 60 KPa	1.0 - 2.0 seconds 4 tests per trip	Delta MAP and software	DTC TYPE A
EGR VACUUM CONTROL SIGNAL SOLENOID VALVE CKT MALF (ODM)	P0403	Digital	0 to 100% duty cycle. Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	Engine speed > 600rpm.	25 seconds. Continuous.	Component control state and software.	DTC Type B
AIR INJECTION SYSTEM	P0410	Software	**Passive:** O2 sensors indicate lean condition present during open loop operation. Verify proper operation of AIR pump. **Active:** O2 sensors indicate lean conditon present when AIR pump is turned on during closed loop operation	**Passive:** O2 sensor < approx. 400 mv during open loop operation **Active:** O2 sensor <222 mv for > = 1.5 seconds or fuel integrator delta of 14 counts when pump turned on during closed loop operation	**Passive:** No MAF, MAP, IAT, ECT, TPS, O2, injector, misfire, EGR, fuel system, AIR pump relay IAC or CCP DTC set O2 mid bias volt test passed Engine run> 2 seconds Air flow < 26 g/s ECT < 115 deg C A/F Ratio > 13:1 Engine load < 17 counts (17 COUNTS IS APPROX. 22% OF FULL ENGINE LOAD.) Ignition voltage > 11 volts PE, DFCO, COT not active **Active:** Same as above except: MBV test fail will not disable Engine run > = 200 sec after closed loop operation A/F = 14.7:1 Fuel integrator >120 & < 136 RPM > 600 ECT > = 60 Deg C Engine load < 14 cts. Air flow < = 17 g/s IAT >10 deg. C In BLM cell 0,1,2,5,6,9,17 or 18	**Passive:** During open loop operation. Once per trip. **Active:** 3 seconds Up to 3 times per trip if passive test fails or is inconclusive	**Passive:** O2 sensor state **Active:** O2 sensor state or fuel integrator state	DTC Type B
AIR INJECTION SYSTEM RELAY CONTROL CKT MALF (ODM)	P0412	Digital	0 to B+. Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	Engine speed > 600rpm.	5 seconds. Continuous.	Component control state and software.	DTC Type B

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BANK 1 CATALYTIC CONVERTER LOW OXYGEN STORAGE	P0420	Analog	Comparing rear O2 sensor signal amplitude to the front O2 sensor signal amplitude thereby measuring the oxygen storage capabilty of the catalytic converter.	Rear O2 amplitude approaches a calibrated threshold (approx. 90% of front O2 amplitude)	Catalyst predicted temperature, gear, MAP, TPS, Vehicle speed, RPM, O2 duty cycle, O2 error,flow.	Test run once per trip, 50 acceptable O2 samples collected for a decision.	Rear O2 amplitude (catalyst oxygen storage)	DTC Type A
BANK 2 CATALYTIC CONVERTER LOW OXYGEN STORAGE	P0430	Analog	Comparing rear O2 sensor signal amplitude to the front O2 sensor signal amplitude thereby measuring the oxygen storage capabilty of the catalytic converter.	Rear O2 amplitude approaches a calibrated threshold (approx. 90% of front O2 amplitude)	Catalyst predicted temperature, gear, MAP, TPS, Vehicle speed, RPM, O2 duty cycle, O2 error, flow.	Test run once per trip, 50 acceptable O2 samples collected for a decision.	Rear O2 amplitude (catalyst oxygen storage)	DTC Type A
EVAP VACUUM SWITCH CKT LOW (DURING PURGE)	P0441	Digital	0V - 5V Detects a purge solenoid stuck closed by monitoring the Evap. Purge Vacuum Switch state when purge is commanded. The vacuum switch state should change to high (open) if there is vacuum (solenoid open) applied to the system.	Evap. purge vacuum switch state = low (closed) for a period > 5 seconds.	No Vacuum Switch DTC No IAT, MAP, ECT, TP or EGR DTC No Purge Solenoid ODM Baro > = 75 kPa ECT < 115 Deg C IAT > 2 Deg C ECT/IAC Delta < 27 Deg C Purge Duty Cycle > 90% Manif. Vac. > 16 & <150 cts. TP < 50% Engine RPM > 800 but < 3000	For 5 test failures Continuous	Evap. Purge Vacuum Switch State	DTC Type B
EVAP CANISTER PURGE SOLENOID VALVE CKT MALF (ODM)	P0443	Digital	0 to 100% duty cycle. Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	Engine speed > 600rpm.	25 seconds. Continuous.	Component control state and software.	DTC Type B
VEHICLE SPEED SENSOR SYSTEM PERFORMANCE (MAN)	P0500	Variable frequency	Filtered Vehicle speed > 0; This DTC detects a missing signal from the vehicle speed sensor in a manual transmission vehicle.	Vehicle speed = 0 when enable conditions met	Manual VSS diagnostic enabled No MAP DTC's set No TPS DTC's set No ECT DTC's set No idle system DTC's set No IAC valve DTC's set Coolant > = 0 deg. C Engine speed > 1000 rpm 5 % < throttle position < 100 % A/C off: 40 kpa < MAP < 100 kpa A/C on: 45 kpa < MAP < 100 kpa Above conditions met > 2 seconds to enable diagnostic	255 failures within a 255 sample limit Continuous	Variable reluctance transducer	DTC Type B

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IDLE CONTROL SYSTEM LOW ENGINE SPEED	P0506	Software	Determines if a low idle is a result of an engine mechanical problem. Low RPM is 88 RPM below desired	**Passive:** Idle > 88 RPM low from desired **Intrusive:** Air flow change > 1.875 G/S	**Passive:** No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 25 sec. ECT > = 60 Deg C Baro > 75 kPa Canister Purge = 0% or > 75% Ign. voltage > 10 & < 17 volts IAT > -15 deg C TP < 1% VS < = 1 MPH Time > 8 seconds **Intrusive:** Idle > 88 RPM low for > 5 seconds Air flow > 14 g/s & < 35 g/s VS > 20 & < 77 MPH TP delta < 2% RPM delta < 50 RPM IAC position > = 52 steps IAC ramped in up to 45 steps	**Passive:** Monitored for 5 seconds Continuously after enable condirions met **Intrusive:** Once after passive test indicates a low idle condition exists	Software and stepper motor	DTC Type B
IDLE CONTROL SYSTEM HIGH ENGINE SPEED	P0507	Software	Determines if a high idle is a result of an engine mechanical problem. High RPM is 100 RPM above desired	Passive: Idle > 100 RPM high from desired Intrusive: Air flow change > 1.875 G/S	Passive: No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 25 sec. ECT > = 60 Deg C Baro > 75 kPa Canister Purge = 0% or > 75% Ign. voltage > 10 & <17 volts IAT > -15 deg C TP < 1% VS < = 1 MPH Time > 8 seconds. Intrusive: Idle > 88 RPM low for > 5 seconds Air flow > 10 g/s & < 35 g/s VS > 20 & < 77 MPH TP delta < 2% RPM delta < 50 RPM IAC position > = 52 steps IAC ramped in up to 45 steps	Passive: Monitored for 5 seconds Continuously after enable condirions met Intrusive: Once after passive test indicates a low idle condition exists	Software and stepper motor	DTC Type B
PCM - FLASH EEPROM CHECKSUM ERROR	P0601	Software	This DTC indicates that the PCM is unable to correctly read data from the flash memory devices in the time and/or event processors.	Calculated checksum incorrect for this program	Ignition on.	1 test failure. Every 100 ms	Software	DTC Type A

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O2S System -Too Few O2S R/L and L/R Switchs(Bank1,sensor 1)	P1133	Analog	0 Volts To 1.1 Volts The DTC determines if the O2 sensor is functioning property by monitoring the number of L/R and R/L switches.	Number of switches in 100 seconds: L/R switches <30 R/L switches <20	No TP sensor DTC's. DTC P0135 (O2heater) not set. Closed loop fuel control O2 ready test passed for Bank 1, sensor 1, Bank 1 short term fuel trim operating. A/F= 14.7 9≤ Ignition voltage ≤ 16 1000 ≤ Engine speed ≤1700 RPM 15 ≤ Engine Airflow ≤ 32 Grams/Sec	100 seconds,once per key cycle	Exhaust Oxygen Sensor PCM Interface Circuit	DTC Type B
O2S System - Too Few O2S R/L and L/R Switches (Bank 2,Sensor 1)	P1153	Analog	0 Volts to 1.1Volts The DTC determines if the O2 sensor is functioning properly by monitoring the number of L/R and R/L switches.	Number of switches in 100 seconds: L/R switches <30 R/L switches <20	No TP sensor DTC's. DTC P0155 (O2 heater) not set. Closed loop fuel control O2 ready test passed for Bank 2,Sensor 1 Bank 2 short term fuel trim operating A/F = 14.7 9≤ Ignition voltage ≤16 1000 ≤ Engine speed ≤1700 RPM 15 ≤ Engine Airflow ≤32 Grams/Sec	100 Seconds, once per key cycle	Exhaust Oxygen Sensor PCM Interface Circuit	DTC TYPE B
IGNITION CONTROL CKT HIGH	P1351	Digital	0 Volt - 5 Volt This diagnostic will determine if a failure has occured due to an open circuit.	EST Voltage > 4.61 volts	EST open test enabled	100 test failures within a 100 test sample. Every 100 ms	Software	DTC Type A
IGNITION CONTROL CKT LOW	P1361	Digital	0 Volt - 5 Volt This diagnostic will determine if a failure has occured due to a grounded circuit.	Delta EST feedback pulse accumulator < 8 counts	EST grounded test enabled	100 test failures within a 100 test sample. Every 100 ms	Software	DTC Type A
DISTRIBUTOR IGNITION SYSTEM - LOW RES PULSE LOSS	P1371	Digital	0 Volt - 5 Volt This diagnostic will determine if the PCM is detecting a lo res pulse loss.	Hi res delta > 720 [(Hi res pulse count) - (Hi res count at last Lo res rising edge)]	Lo res failure test enabled	20 test failures within a 30 test sample. Every 100 ms	Software	DTC Type A
EVAP VACUUM SWITCH CKT HIGH (DURING NON-PURGE)	P1441	Software	0V - 5V Detects a purge solenoid stuck open by monitoring the Evap. Purge Vacuum Switch state when no purge is commanded. The vacuum switch state should change to low (closed) if there is no vacuum (solenoid closed) applied to the system.	Evap. purge vacuum switch state = high (open) for a period > 5 seconds.	No Vacuum Switch DTC No IAT, MAP, ECT, TP or EGR DTC No Purge Solenoid ODM Baro > = 65 kPa ECT < 115 Deg C IAT > 2 Deg C ECT/IAC Delta < 27 Deg C Purge Duty Cycle < = 5% Manifold Vacuum > 32 KPA & < 75 KPA TP > 0% & < 50% Engine RPM > 800 but < 3000	For 5 test failures Continuous	Evap. Purge Vacuum Switch State	DTC Type B

SENSED PARAMETER	FAULT CODE	SENSOR SIGNAL TYPE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	MONITORING METHOD	FAULT CODE STORAGE AND MIL ILLUMIN. (A,or B)
IDLE AIR CONTROL VALVE CKT LOW	P1508	Software	Determines if a low idle is a result of the IAC valve or circuit. Low RPM is 88 RPM below desired	**Passive:** Idle > 88 RPM low from desired **Intrusive:** Air flow change < 1.875 G/S	**Passive:** No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 25 sec. ECT > = 60 Deg C Baro > 65 kPa Canister Purge = 0% or > 75% Ign. voltage > 10 & < 17 volts IAT > -15 deg C TP < 1% VS < = 1 MPH Time > 8 seconds. **Intrusive:** Idle > 100 RPM high for > 5 seconds Air flow > 10 g/s & < 35 g/s VS > 20 & < 77 MPH TP delta < 2% RPM delta < 50 RPM IAC position > 52 steps IAC ramped in up to 45 steps	**Passive:** Monitored for 5 seconds Continuously after enable condirions met **Intrusive:** Once after passive test indicates a low idle condition exists	Software and stepper motor	DTC Type B
IDLE AIR CONTROL VALVE CKT HIGH	P1509	Software	Determines if a high idle is a result of the IAC valve or circuit. Low RPM is 100 RPM above desired	**Passive:** Idle > 100 RPM high from desired **Intrusive:** Air flow change < 1.875 G/S	**Passive:** No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 25 sec. ECT > = 60 Deg C Baro > 65 kPa Canister Purge = 0% or > 75% Ign. voltage > 10 & < 17 volts IAT > -15 deg C TP < 1% VS < = 1 MPH Time > 8 seconds. **Intrusive:** Idle > 100 RPM high for > 5 seconds Air flow > 10 g/s & < 35 g/s VS > 20 & < 77 MPH TP delta < 2% RPM delta < 50 RPM IAC position > 52 steps IAC ramped in up to 45 steps	**Passive:** Monitored for 5 seconds Continuously after enable condirions met **Intrusive:** Once after passive test indicates a low idle condition exists	Software and stepper motor	DTC Type B
TRACTION CONTROL CKT ACTIVE TOO LONG IN P/N	P1572	Digital	0 volts to 12 volts This DTC detects when the traction control is active in P/N	Traction control active	No PSA DTC'S in P/N	6.4 SEC	Circuit	DTC Type A

SENSED PARAMETER	FAULT CODE	SENSOR SIGNAL TYPE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	MONITORING METHOD	FAULT CODE STORAGE AND MIL ILLUMIN. (A,or B)
PRIMARY COOLING FAN RELAY CONTROL CKT MALF (ODM)	P1641	Digital	0 volt to B+. Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	DTC'S P0117,P0118 not set. Engine speed greater than 600 rpm. The PCM detects that the commanded state of the driver and the actual state of the control circuit do match.	5 seconds. Continuous.	Component control state and software.	DTC Type A
SECONDARY COOLING FAN RELAY CONTROL CKT MALF (ODM)	P1642	Digital	0 volt to B+. Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	DTC'S P0117,P0118 not set. Engine speed greater than 600 rpm. The PCM detects that the commanded state of the driver and the actual state of the control circuit do match.	5 seconds. Continuous.	Component control state and software.	DTC Type A
2^{ND} AND 3^{RD} GEAR BLOCKOUT RELAY CKT MALF (ODM)	P1657	Digital	0 volt to B+. Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	DTC'S P0117,P0118 not set. Engine speed greater than 600 rpm. The PCM detects that the commanded state of the driver and the actual state of the control circuit do match	5 seconds. Continuous.	Component control state and software.	DTC Type A
MALFUNCTION INDICATOR LAMP CKT MALF (ODM)	P1661	Digital	1 volt to B+. Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	DTC'S P0117,P0118 not set. Engine speed greater than 600 rpm. The PCM detects that the commanded state of the driver and the actual state of the control circuit do match	5 seconds. Continuous.	Component control state and software.	DTC Type A

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VEHICLE SPEED SENSOR - LOW INPUT	P0502	Analog	0 to 6000 RPM This DTC detects a low vehicle speed when the vehicle has a large engine speed in a drive gear range..	Output Speed < 250RPM.	Gear Range is not Park/Neutral No PSA sensor DTC's set No TP high or low sensor DTC's set Throttle Position > 17% No MAP sensor high or low DTC's set 50 kpa>VAC<80 kpa 0 ftlbs < Engine Torque < 65535 ftlbs 3000 rpm >Engine Speed < 5500 rpm	3 seconds Continuous	AC Voltage generating Vehicle Speed Sensor	DTC Type A
TRANS FLUID TEMP SENSOR CIRCUIT - LOW INPUT	P0712	Analog	.24V to 5.0V This DTC detects a continuous short to ground in the TTS signal circuit or the TTS sensor	Raw TTS < 0.196 volts.	No DTC P0560 Ignition "on"	10 seconds Continuous	Thermistor	DTC Type B
TRANS FLUID TEMP SENSOR CIRCUIT - HIGH INPUT	P0713	Analog	.24V to 5.0V This DTC detects a conttinuous open or short to high in the TTS signal circuit or the TTS sensor.	Raw TTS > 4.94 volts	No DTC P0560 Ignition "on"	50 seconds Continuous	Thermistor	DTC Type B
BRAKE SWITCH CIRCUIT LOW	P0719	Analog	0V to 12.0V This DTC detects an open brake switch during accelerations	Accel counts > 7 and brake is on for 900 sec without going off for 2 sec.	No VSS DTC's Brake Switch Off is not passed Increment Accel counter when Brake Switch is on and vehicle speed < 5 mph then 5 mph < vehicle speed < 20 mph for 6 sec then vehicle speed > 20 mph for 4 sec	7 test failures within 7 test samples Continuous	Switch	DTC Type A
TCC SYSTEM STUCK ON	P0742	Software	This DTC detects low torque converter slip when the TCC is commanded off.	TCC stuck on counter > 3 This is incremented if enable conditions are met, only once per TCC cycle	40 kpa < VAC < 80 kpa 0 ftlbs <engine torque < 65535 ftlbs Commanded Gear is not 1st Gear Range is D4, D3 or D2 No PSA sensor DTC's set No TP sensor high or low DTC's set Throttle Position > 13% Engine Running > 450 rpm for > 2 sec Engine Speed < 5500 rpm TCC is commanded off No VSS low or intermittent DTC's set -20 rpm < TCC Slip < 20 rpm for > 5.6 sec No TCC Enable Solenoid DTC's set No TCC Control Solenoid DTC's set	Continuous	1X Engine Speed Signal and the Vehicle Speed Sensor	DTC Type A

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SHIFT SOLENOID A PERFORMANCE	P0751	Analog	This DTC detects 2-2-3-3 or 1-1-4-4 shift patterns	Fail Counter > 2. The fail counter is incremented if fail cases (1,2,3&4) or (1,2,3&5) are true.	General Engine running No TPS high or low DTC's set No VSS low or intermittent DTC's set No PSA DTC's set Gear range is D4 Vehicle speed > 5 mph 20C<TTS<30C No Sol Electrical DTC's set No DTC P0742 Traction Control not active Previous shift time > 0 sec Fail Case 1 Commanded 1-2 shift 13%**<TPS<42% TPS constant within +/- 3% 5 mph < VSS < 30 mph In 2.8** seconds, engine speed in 2nd gear must be 100** rpm > last speed in 1st gear Fail Case 2 Commanded 2-3 shift 13%** < TPS < 32% TPS constant within +/- 5% 20 mph <VSS < 45 mph In 1.7 seconds, engine speed in 3rd gear must be 75 rpm < last speed in 2nd gear Fail Case 3 Commanded 3-4 shift 13%** < TPS < 30% TPS constant within +/- 3% 28 mph <VSS < 65 mph In 4.5** seconds, engine speed in 4th gear must be 10** rpm > last speed in 3rd gear Fail Case 4 Commanded 4th gear TCC on 13% < TPS < 26% .85 < Speed Ratio < 1.2 300 < TCC Slip < 2000 for > 4 seconds Fail Case 5 Commanded 4th gear TCC on 13% < TPS < 26% .5 < Speed Ratio < .788 -20 < TCC Slip < 20 for > 4 seconds *5.7L B,D w/2.56 FC1: 50 rpm; 3, 5 sec **F, Y, 4.3L B FC1: 17%; 150 rpm; 2.5 sec FC2: 17% FC3: 17%; 20 rpm; 3.0 sec	Continuous	Shift Solenoid	DTC Type B
SHIFT SOLENOID A ELECTRICAL	P0753	Analog	0 V to 12V; This DTC detects a continuous open or short to ground in the SSA circuit or the SSA sensor.	Fail counter > 43 counts out of 50 total counts	No system voltage DTC's Ignition on	Continuous	Shift Solenoid	DTC Type A

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SHIFT SOLENOID B PERFORMANCE	P0756	Software	This DTC detects a non-2-3 upshift and a non-1st gear is commanded or 1st gear when 4th gear commanded.	Fail Case 1 Stuck on counter > 2: it is incremented if fail cases 3 & 4 are true or Fail Case 2 Gear stuck off counter > 1: it is incremented if fail cases 1 & 3 or 2 & 3 are true.	General Vehicle Speed > 15 mph Gear Range is D4 20C>Trans Fluid Temp>130C TCC not on 20<VAC<99 0<Engine Torque<65535 No TTS sensor DTC's set No TPS high or low DTC's set No VSS low or intermittent DTC's set No PSA DTC's set No Sol Electrical DTC's set No DTC P0742 Engine Speed<5500rpm Engine running > 450 rpm for > 2sec Fail Case 1 TPS>38% 1st is commanded for 2.5 sec 0.5 rpm< Speed Ratio < 2.59 600rpm < output speed < 1500rpm -93rpm < TCC Slip < -2000rpm for 1.6 sec Fail Case 2 TPS > 100% 2nd commanded for 25.5 sec 8 < Speed Ratio < 8 8191rpm < output speed < 8191rpm 0rpm < TCC Slip < 0rpm for 25.5 sec Fail Case 3 13% >TPS > 55% TPS remains +/- 3% 3rd commanded for 1 sec 3rd commanded speed ratio > last 2nd commanded speed ratio - .2 3rd commanded TCC Slip >= last 2nd commanded TCC slip + 200 rpm for 1.3 sec; discontinue test if time since shift commanded > 5 seconds. Fail Case 4 TPS > 18% 4th commanded for 1 sec 2.05 < Speed Ratio < 8 0rpm < Output Speed < 8191rpm 1000 < TCC Slip < 4000 for 3 seconds	Continuous	Shift Solenoid	DTC Type B
SHIFT SOLENOID B ELECTRICAL	P0758	Analog	0 V to 12V; This DTC detects a continuous open or short to ground in the SSB circuit or the SSB sensor.	Fail counter > 43 counts out of 50 total counts	No system voltage DTC's Ignition on	Continuous	Shift Solenoid	DTC Type A
TRACTION CONTROL CKT ACTIVE TOO LONG	P1572	Digital	0V to 12V This DTC detects when the Traction Control Circuit is active in P/N	Traction Control active	No PSA DTC's In P/N	6.4 sec	Circuit	DTC Type A

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PSA CIRCUIT MALFUNCTION	P1810	Digital	0V to 12V This DTC detects an invalid state of the PSA sensor or the PSA circuit by deciphering the PSA inputs.	This DTC will fail if any of the following fail cases are true: Fail Case 1 Illegal Trans Pressure Switch state Fail Case 2 Gear range is D2, D4, Rev Fail Case 3 Gear range is P/N	Fail Case 1 Engine running No system voltage DTC's Fail Case 2 No system voltage DTC's No VSS DTC's Engine speed < 100 rpm for > .3 sec then 100 rpm < Engine Speed < 600 rpm for > .3 sec then Engine Speed > 600 rpm for > 3 sec Vehicle Speed < 2 mph Fail Case 3 4th gear .39 < Speed Ratio < .8 35 kpa < VAC < 70 kpa 0 ftlbs < Engine Torque < 65535 ftlbs TCC locked on No VSS DTC's Engine Speed < 2000 rpm	Fail Case 1 5 seconds Fail Case 2 3 seconds Fail Case 3 5 seconds Continuous	Pressure Switch Assembly	DTC Type B
TCC PWM SOLENOID ELECTRICAL	P1860	Analog	0V to 12V This DTC detects a continuous open or short to ground in the TCC PWM circuit or the TCC PWM sensor	Fail counter > 43 counts out of 50 total counts	No system voltage DTC's Ignition On Gear = 1st No SSA DTC's No SSB DTC's Runs only during intrusive test: TCC = 100% for .1 sec TCC = 0% for > 5 sec 1 time per key cycle	Continuous	TCC PWM Solenoid	DTC Type A
TCC SOLENOID ELECTRICAL	P1864	Analog	0V to 12V This DTC detects a continuous open or short to ground in the TCC circuit or the TCC sensor	Fail counter > 43 counts out of 50 total counts	No system voltage DTC's Ignition On	Continuous	TCC Solenoid	DTC Type A
TRANSMISSION COMPONENT SLIPPING	P1870	Software	This DTC detects excessive TCC slip when the torque converter clutch should be engaged.	Trans Slip Counter >3	Engine running > sec Engine Speed < 5500 rpm Gear is not 1st No TPS high or low DTC's set 13% < TPS < 36% No TTS DTC's set 20C < TTS < 130C No PSA DTC's set No VSS low or intermittent DTC's set No TCC Enable Solenoid DTC's set No TCC Control Solenoid DTC's set No SSA DTC's set No SSB DTC's set 35 kpa < Engine Vacuum < 70* kpa (* 85 kpa for 5.7L D car with 3.42 axle) 0 ftlbs < Engine Torque < 65535 ftlbs Gear Range is D4 TCC at max apply for > .1 sec TCC on for > .1 sec Shift Solenoid Perf counters equal zero TCC Slip > 130 rpm for > 8 sec	Continous	1X Engine Speed Signal and the Vehicle Speed Sensor	DTC Type A
3 - 2 CONTROL SOLENOID ELECTRICAL	P1886	Analog	0V to 12V This DTC detects a continuous open or short to ground in the 3 - 2 control solenoid circuit or the 3 - 2 control solenoid sensor	Fail counter > 43 counts out of 50 total counts	No system voltage DTC's Ignition On	Continuous	3 - 2 Control Solenoid	DTC Type A

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			Active: O2 sensors indicate lean conditon present when AIR pump is turned on during closed loop operation.	Active: O2 sensor <222 mv for > = 1.5 seconds or fuel integrator delta of 14 counts when pump turned on during closed loop operation.	Active: Same as above except: MBV test fail will not disable Engine run > = 200 sec after closed loop operation A/F = 14.7:1 Fuel integrator >120 & < 138 RPM > 600 ECT > = 60 Deg C Engine load < 14 cts. Air flow < = 17 g/s	Active: 3 seconds Up to 3 times per trip if passive test fails or is inconclusive	Active: O2 sensor state or fuel integrator state	
					In BLM cell 0,1,2,5,6,9,17 or 18			
AIR INJECTION SYSTEM RELAY CONTROL CKT MALF (ODM)	P0412	Digital	0 to B+. Control circuit voltage is monitored during operation, it should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	Engine speed > 600rpm.	5 seconds. Continuous.	Component control state and software.	DTC Type B
BANK 1 CATALYTIC CONVERTER LOW OXYGEN STORAGE	P0420	Analog	Comparing rear O2 sensor signal amplitude to the front O2 sensor signal amplitude thereby measuring the oxygen storage capabilty of the catalytic converter.	Rear O2 amplitude approaches a calibrated threshold (approx. 90% of front O2 amplitude)	Catalyst predicted temperature, gear, MAP, TPS, Vehicle speed, RPM, O2 duty cycle, O2 error.	Test run once per trip, 50 acceptable O2 samples collected for a decision.	Rear O2 amplitude (catalyst oxygen storage)	DTC Type A
BANK 2 CATALYTIC CONVERTER LOW OXYGEN STORAGE	P0430	Analog	Comparing rear O2 sensor signal amplitude to the front O2 sensor signal amplitude thereby measuring the oxygen storage capabilty of the catalytic converter.	Rear O2 amplitude approaches a calibrated threshold (approx. 90% of front O2 amplitude)	Catalyst predicted temperature, gear, MAP, TPS, Vehicle speed, RPM, O2 duty cycle, O2 error.	Test run once per trip, 50 acceptable O2 samples collected for a decision.	Rear O2 amplitude (catalyst oxygen storage)	DTC Type A
EVAP VACUUM SWITCH CKT LOW (DURING PURGE)	P0441	Digital	0V - 5V Detects a purge solenoid stuck closed by monitoring the Evap. Purge Vacuum Switch state when purge is commanded. The vacuum switch state should change to high (open) if there is vacuum (solenoid open) applied to the system.	Evap. purge vacuum switch state = low (closed) for a period > 5 seconds.	No Vacuum Switch DTC No IAT, MAP, ECT, TP or EGR DTC No Purge Solenoid ODM Baro > = 75 kPa ECT < 115 Deg C IAT > 2 Deg C ECT/IAC Delta < 127 Deg C Purge Duty Cycle > 80% Manif. Vac. > 18 & <150 cts. TP < 60% Engine RPM > 800 but < 3000	For 5 test failures Continuous	Evap. Purge Vacuum Switch State	DTC Type B
EVAP CANISTER PURGE SOLENOID VALVE CKT MALF (ODM)	P0443	Digital	0 to 100% duty cycle. Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	Control circuit voltage near B+ when commanded "on", or voltage near 0 volt when commanded "off".	Engine speed > 600rpm.	25 seconds. Continuous.	Component control state and software.	DTC Type B
VEHICLE SPEED SENSOR SYSTEM PERFORMANCE (MAN)	P0500	Variable frequency	Filtered Vehicle speed > 0; This DTC detects a missing signal from the vehicle speed sensor in a manual tranemission vehicle.	Vehicle speed = 0 when enable conditions met	Manual VSS diagnostic enabled No MAP DTC's set No TPS DTC's set No ECT DTC's set No idle system DTC's set No IAC valve DTC's set Coolant > = 0 deg. C Engine speed > 1000 rpm 5 % < throttle position < 100 %	255 failures within a 255 sample limit Continuous	Variable reluctance transducer	DTC Type B

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					(continued) A/C off: 40 kpa < MAP < 100 kpa A/C on: 45 kpa < MAP < 100 kpa Above conditions met > 2 seconds to enable diagnostic			
IDLE CONTROL SYSTEM LOW ENGINE SPEED	P0506	Software	Determines if a low idle is a result of an engine mechanical problem. Low RPM is 88 RPM below desired	Passive: Idle > 88 RPM low from desired	Passive: No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 25 sec. ECT > = 60 Deg C Baro > 75 kPa Canister Purge = 0% or > 75% Ign. voltage > 10 & < 17 volts IAT > -15 deg C TP < 1% VS < = 1 MPH Time > 8 seconds.	Passive: Monitored for 5 seconds Continuously after enable conditions met	Software and stepper motor	DTC Type B
				Intrusive: Air flow change > 1.875 G/S	Intrusive: Idle > 88 RPM low for > 5 seconds Air flow > 14 g/s & < 35 g/s VS > 20 & < 77 MPH TP delta < 2% RPM delta < 50 RPM IAC position > = 52 steps IAC ramped in up to 45 steps	Intrusive: Once after passive test indicates a low idle condition exists		
IDLE CONTROL SYSTEM HIGH ENGINE SPEED	P0507	Software	Determines if a high idle is a result of an engine mechanical problem. High RPM is 100 RPM above desired	Passive: Idle > 100 RPM high from desired	Passive: No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 25 sec. ECT > = 60 Deg C Baro > 75 kPa Canister Purge = 0% or > 75% Ign. voltage > 14 & < 17 volts IAT > -15 deg C TP < 1% VS < = 1 MPH Time > 8 seconds.	Passive: Monitored for 5 seconds Continuously after enable conditions met	Software and stepper motor	DTC Type B
				Intrusive: Air flow change > 1.875 G/S	Intrusive: Idle > 88 RPM low for > 5 seconds Air flow > 10 g/s & < 35 g/s VS > 20 & < 77 MPH TP delta < 2% RPM delta < 50 RPM IAC position > = 52 steps IAC ramped in up to 45 steps	Intrusive: Once after passive test indicates a low idle condition exists		
PCM - FLASH EEPROM CHECKSUM ERROR	P0601	Software	This DTC indicates that the PCM is unable to correctly read data from the flash memory devices in the time and/or event processors.	Calculated checksum incorrect for this program	Ignition on.	1 test failure. Every 100 ms	Software	DTC Type A

1996 4.3L (L99) B-car Engine Diagnostic Parameters

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SENSED PARAMETER	FAULT CODE	SENSOR SIGNAL TYPE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	MONITORING METHOD	FAULT CODE STORAGE AND MIL ILLUMIN. (A,or B)
IGNITION CONTROL CKT HIGH	P1351	Digital	0 Volt - 5 Volt This diagnostic will determine if a failure has occured due to an open circuit.	EST Voltage > 4.61 volts	EST open test enabled	100 test failures within a 100 test sample. Every 100 ms	Software	DTC Type A
IGNITION CONTROL CKT LOW	P1361	Digital	0 Volt - 5 Volt This diagnostic will determine if a failure has occured due to a grounded circuit.	Delta EST feedback pulse accumulator < 8 counts	EST grounded test enabled	100 test failures within a 100 test sample. Every 100 ms	Software	DTC Type A
DISTRIBUTOR IGNITION SYSTEM - LOW RES PULSE LOSS	P1371	Digital	0 Volt - 5 Volt This diagnostic will determine if the PCM is detecting a lo res pulse loss.	Hi res delta > 720 [(Hi res pulse count) - (Hi res count at last Lo res rising edge)]	Lo res failure test enabled	20 test failures within a 30 test sample. Every 100 ms	Software	DTC Type A
EVAP VACUUM SWITCH CKT HIGH (DURING NON-PURGE)	P1441	Software	0V - 5V Detects a purge solenoid stuck open by monitoring the Evap. Purge Vacuum Switch state when no purge is commanded. The vacuum switch state should change to low (closed) if there is no vacuum (solenoid closed) applied to the system.	Evap. purge vacuum switch state = high (open) for a period > 5 seconds.	No Vacuum Switch DTC No IAT, MAP, ECT, TP or EGR-DTC No Purge Solenoid ODM Baro > = 65 kPa ECT < 115 Deg C IAT > 2 Deg C ECT/IAC Delta < 127 Deg C Purge Duty Cycle < = 0% Manifold Vacuum > 32 & < 240 TP > 0% & < 50% Engine RPM > 800 but < 3000	For 5 test failures Continuous	Evap. Purge Vacuum Switch State	DTC Type B
EVAP VACUUM SWITCH CKT HIGH (IGNITION-ON TEST)	P1442	Software	0V - 5V Performed as part of the evap. solenoid diagnostic inhibit criteria. Detects a purge vacuum switch stuck in the open (high vacuum) position when there is no vacuum in the system.	Vacuum switch state = high (open)	Key "ON", engine "OFF"	On key-up until engine run flag is set Once per ignition cycle	Evap. purge vacuum switch	DTC Type B
IDLE AIR CONTROL VALVE CKT LOW	P1508	Software	Determines if a low idle is a result of the IAC valve or circuit. Low RPM is 88 RPM below desired	Passive: Idle > 88 RPM low from desired	Passive: No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 25 sec. ECT > = 60 Deg C Baro > 65 kPa Canister Purge = 0% or > 75% Ign. voltage > 10 & < 17 volts IAT > -15 deg C TP < 1% VS < = 1 MPH Time > 8 seconds.	Passive: Monitored for 5 seconds Continuously after enable condirions met	Software and stepper motor	DTC Type B
				Intrusive: Air flow change < 1.875 G/S	Intrusive: Idle > 100 RPM high for > 5 seconds Air flow > 10 g/s & < 35 g/s VS > 20 & < 77 MPH TP delta < 2% RPM delta < 50 RPM IAC position > 52 steps IAC ramped in up to 45 steps	Intrusive: Once after passive test indicates a low idle condition exists		