1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

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Sensed Parameter	FAULT CODE	Monitor Strategy Description	Malfunction Criteria &Threshold Value (s)	Secondary Parameters & Enable Conditions	Time Required & Frequency	MIL Illum. Type
MASS AIR FLOW SYSTEM CKT MALF (STATIC FREQ.)	P0100	Rationality 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.	RPM > = 50 System Voltage > = 10 volts Above conditions met for > = 1.0 second.	4 Consecutive Reads Reference interrupt loop Continuous.	DTC Type A
MASS AIR FLOW SYSTEM PERFORMANCE (RATIONALITY)	P0101	Rationality 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 exists.	Mass Air Flow frequency > 40% different from speed density calculation at low flow conditions, to > 25% different at higher flow conditions.	No MAF,MAP or TPS DTC'S Engine Speed □ 50 rpm but < 2800 rpm. System Voltage > = 10 volts TP < 50% when engine vacuum > 40 kpa All above condition's are stable for 2 seconds.	100 ms/test Continuous.	DTC Type A
MASS AIR FLOW SENSOR CKT LOW FREQUENCY	P0102	Circuit Continuity Detects Mass Air Flow frequency readings outside normal operating range. If the frequency is outside a calibrated range, a faulty Mass Air Flow condition exists.	Mass Air Flow frequency < 1000 hz	Engine Speed > = 50 RPM System Voltage > = 10 volts Above conditions met for >= 1.0 second.	20 test failures in a 50 test sample. Reference interrupt loop Continuous.	DTC Type A
MASS AIR FLOW SENSOR CKT HIGH FREQUENCY	P0103	Circuit Continuity Detects Mass Air Flow frequency readings outside normal operating range. If the frequency is outside a calibrated range, a faulty Mass Air Flow condition exists.	Mass Air Flow frequency > 10,700 hz	Engine Speed > = 50 RPM System Voltage > = 10 volts Above conditions met for >= 1.0 second.	20 test failures in a 50 test sample. Reference interrupt loop Continuous.	DTC Type A

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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MANIFOLD ABSOLUTE PRESSURE SYSTEM PERFORMANCE	P0106	Rationality 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 > 10 kpa within 6.25 ms	AC Clutch/Brake Sw/Clutch Sw/Power Steering Sw = no change No TP, MAP DTC's set Acceleration Slip Reduction (ASR)/Traction Control System (TCS) Inactive Engine Speed delta < 100 RPM TPdelta < 5% EGR Flow Rate delta < 25% Idle Air delta < 5 cts All conditions are stable for .5 sec. and met for 4.5 sec	45 test failures in a 50 test sample. 6.25 ms/test (Every MAP read) Continuous	DTC Type B
MANIFOLD ABSOLUTE PRESSURE SENSOR CKT LOW	P0107	Circuit Continuity This DTC detects a continuous short to low or open in either the signal circuit or the MAP sensor.	Raw MAP < .24 Volts	No TP sensor DTC's set Throttle Position >= 15% All conditions met for 4.5 sec.	45 test failures in a 50 test sample. 6.25 ms/test (Every MAP read) Continuous	DTC Type B
MANIFOLD ABSOLUTE PRESSURE SENSOR CKT HIGH	P0108	Circuit Continuity 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 in a 50 test sample. 6.25 ms/test (Every MAP read) Continuous	DTC Type B
INTAKE AIR TEMP SENSOR CKT LOW (HIGH TEMP)	P0112	Circuit Continuity This DTC detects a continuous short to ground in the IAT signal circuit or the IAT sensor	<u>Low, High Resistance Pullup</u> 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 in a 50 test sample 100 ms/test Continuous	DTC Type B
INTAKE AIR TEMP SENSOR CKT HIGH (LOW TEMP)	P0113	Circuit Continuity This DTC detects a continuous open or short to high in the IAT signal circuit or the IAT sensor	<u>Low, High Resistance Pullup</u> 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 in a 50 test sample. 100 ms/test Continuous	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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ENGINE COOLANT TEMP SENSOR CKT LOW (HIGH TEMP)	P0117	Cicuit Continuity 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 in a 50 test sample. 100 ms/test Continuous	DTC Type B
ENGINE COOLANT TEMP SENSOR CKT HIGH (LOW TEMP)	P0118	Circuit Continuity 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 in a 50 test sample. 100 ms/test Continuous	DTC Type B
THROTTLE POSITION SENSOR CKT PERFORMANCE (STUCK)	P0121	Rationality Detects a stuck TP sensor	Last throttle position value > predicted throttle position based on engine RPM	No MAP sensor DTC's set and no other TP sensor DTC's set. Engine Running MAP < 60 kPa TP delta < 1% All condition's present for 38 seconds.	384 test failures in a 512 test sample 6.25 ms/test Continuous	DTC Type B
THROTTLE POSITION SENSOR CKT LOW	P0122	Circuit Continuity Detects a continuous short to low or ground in the signal circuit or the TP sensor	Raw TP sensor signal < 10 A/D counts (0.2 volts)	Ignition On. Condition present for 1 second.	90 test failures in a 100 test sample 6.25 ms/test Continuous	DTC Type A
THROTTLE POSITION SENSOR CKT HIGH	P0123	Circuit Continuity Detects a continuous short to high in the signal circuit or the TP sensor	Raw TP sensor signal > 245 A/D counts (4.9 volts)	Ignition On. Condition present for 1 second.	90 test failures in a 100 test sample 6.25 ms/test Continuous	DTC Type A

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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ENGINE COOLANT TEMP EXCESSIVE TIME TO CLOSED LOOP	P0125	Rationality This DTC detects if a stabilized minimum closed loop is reached and maintained after engine startup.	Minimum stabilized ECT < 60 deg C	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	DTC Type B
(B1S1) HEATED OXYGEN SENSOR CKT LOW	P0131	Circuit Continuity Detects an O2 voltage stationary lean (low signal voltage) condition.	Oxygen sensor voltage below 200 mv	Closed Loop Fuel Control. Learn enable - long term fuel correction TPS: 3-20%	310 test failures in a 330 test sample and polling the rear O2 sensor once. 100 ms/test Continuous	DTC Type A
(B1S1) HEATED OXYGEN SENSOR CKT HIGH	P0132	Crcuit Continuity Detects an O2 voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 775 mv	Closed Loop Fuel Control. Learn enabled - long term fuel correction TPS: 3- 20 %	310 test failures in a 330 test sample and polling the rear O2 sensor once. 100 ms/test Continuous	DTC Type A
(B1S1) HEATED OXYGEN SENSOR CKT SLOW RESPONSE	P0133	Response Detects slow rich to lean and lean to rich O2 signal transition rates.	The oxygen sensor transitions between rich and lean states. O2 sensor averatge transition time: L/R > 100 ms R/L > 100 ms	Closed Loop Fuel Control. rpm and g/sec windows. ex:1000-1700, 15-32 g/sec.	100 sec Once per trip.	DTC Type B
(B1S1) HEATED OXYGEN SENSOR CKT NO ACTIVITY	P0134	Circuit Continuity Detects an O2 circuit open.	Oxygen sensor voltage remains between 352-552 mv	Closed Loop Fuel Control. Predicted Oxygen Sensor Temperature greater than 430 C.	570 test failures in a 600 test sample 100 ms/test Continuous.	DTC Type A

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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(B1S1) HEATED OXYGEN SENSOR HEATER CKT	P0135	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 test passes within a 50 bias sample.	Once during a cold start.	DTC Type B
(B1S2) HEATED OXYGEN SENSOR CKT LOW	P0137	Circuit Continuity Detects an O2 voltage stationary lean (low signal voltage) condition.	Oxygen sensor voltage remains below 40 mv	Closed Loop Fuel Control. Learn Enabled - long term fuel correction TPS: 3-20 %	380 test failures in a 400 test sample and polling the front O2 sensor twice. 100 ms/test Continuous	DTC Type B
(B1S2) HEATED OXYGEN SENSOR CKT HIGH	P0138	Circuit Continuity Detects an O2 voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 930 mv	Closed Loop Fuel Control. Learn Enabled - long term fuel correction TPS: 3-20 %	380 test failures in a 400 test sample and polling the front O2 sensor twice. 100 ms/test Continuous	DTC Type B
(B1S2) HEATED OXYGEN SENSOR CKT NO ACTIVITY	P0140	Circuit Continuity 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.	1450 test failures in a 1500 test sample 100 ms/test Continuous	DTC Type B
(B1S2) HEATED OXYGEN SENSOR HEATER CKT	P0141	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 test passes within a 50 bias sample.	Once during a cold start.	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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(B2S1) HEATED OXYGEN SENSOR CKT LOW	P0151	Circuit Continuity Detects an O2 voltage stationary lean (low signal voltage) condition.	Oxygen sensor voltage below 200 mv	Closed Loop Fuel Control. Learn Enable - long term fuel correction TPS: 3- 20 %	310 test failures in a 330 test sample and polling the rear O2 sensor once. 100 ms/test Continuous	DTC Type A
(B2S1) HEATED OXYGEN SENSOR CKT HIGH	P0152	Circuit Continuity Detects an O2 voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 775 mv	Closed Loop Fuel Control. Learn Enabled - long term fuel correction TPS: 3- 20 %	310 test failures in a 330 test sample and polling the rear O2 sensor once. 100 ms/test Continuous	DTC Type A
(B2S1) HEATED OXYGEN SENSOR CKT SLOW RESPONSE	P0153	Response Detects slow rich to lean and lean to rich O2 signal transition rates.	The oxygen sensor transitions between rich and lean states. O2 sensor average transition time: L/R > 100 ms R/L > 100 ms	Closed Loop Fuel Control. rpm and g/sec windows. ex:1000-1700, 15-32 g/sec.	100 sec Once per trip.	DTC Type B
(B2S1) HEATED OXYGEN SENSOR CKT NO ACTIVITY	P0154	Circuit Continuity Detects an O2 circuit open.	Oxygen sensor voltage remains between 352-552 mv	Closed Loop Fuel Control Predicted Oxygen Sensor Temperature greater than 430 C.	570 test failures in a 600 test sample 100 ms/test Continuous	DTC Type A
(B2S1) HEATED OXYGEN SENSOR HEATER CKT	P0155	Detects a malfunctioning O2 heater circuit by comparing time to O2 activity to a calibrated threshold.	Oxygen sensor time to activity 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 test passes within a 50 bias sample.	Once during a cold start.	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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(B2S2) HEATED OXYGEN SENSOR CKT LOW	P0157	Circuit Continuity Detects an O2 voltage stationary lean (low signal voltage) condition.	Oxygen sensor voltage remains below 40 mv	Closed Loop Fuel Control. Learn Enabled - long term fuel correction TPS: 3-20 %	380 test failures in a 400 test sample and polling the front O2 sensor twice. 100 ms/test Continuous	DTC Type B
(B2S2) HEATED OXYGEN SENSOR CKT HIGH	P0158	Circuit Continuity Detects an O2 voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 930 mv	Closed Loop Fuel Control. Learn Enabled - long term fuel correction TPS: 3-20 %	380 test failures in a 400 test sample and polling the front O2 sensor twice. 100 ms/test Continuous	DTC Type B
(B2S2) HEATED OXYGEN SENSOR CKT NO ACTIVITY	P0160	Circuit Continuity Detects an O2 circuit open.	Oxygen sensor voltage remains between 391-491 mv.	Closed Loop Fuel Control Predicted Oxygen Sensor Temperature greater than 430 C.	1450 test failures in a 1500 test sample 100 ms/test Continuous	DTC Type B
(B2S2) HEATED OXYGEN SENSOR HEATER CKT	P0161	Detects a malfunctioning O2 heater circuit by comparing time to O2 activity to a calibrated threshold.	Oxygen sensor time to activity 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 test passes within a 50 bias sample.	Once during a cold start.	DTC Type B
BANK 1 FUEL TRIM SYSTEM LEAN	P0171	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	DTC TYPE B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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BANK 1 FUEL TRIM SYSTEM RICH	P0172	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	DTC TYPE B
BANK 2 FUEL TRIM SYSTEM LEAN	P0174	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	DTC TYPE B
BANK 2 FUEL TRIM SYSTEM RICH	P0175	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	DTC TYPE B
INJECTOR CKT MALF	P0200	Determines if an injector control circuit is malfunctioning.	Detected voltage on the control circuit near 0 volt.	Engine Speed > 600 rpm.	5 seconds. Continuous.	DTC TYPE A

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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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	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 FTP Threshold - 1.85% I/M Threshold - 1.85% Catalyst Damage - see speed / load chart	Engine run time > 40 revs 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 D < 6.25% / 100 ms - Throttle position D < 1.5% / 100 ms Not a Rough Road - ABS	Emission Level: 5 failed 200 revolution blocks out of 16 Catalyst Damaging Level: 1 failed 200 revolution block Continuous	DTC TYPE B Emission DTC TYPE A Catalyst Damaging
CRANKSHAFT POSITION SENSOR CKT MALF (CKP SEN. TO LOW RES.)	P0335	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 test failures in a 50 test sample. 100 ms/test Continuous	DTC Type B
CRANKSHAFT POSITION SENSOR CKT RANGE/PERF.	P0336	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 test failures in a 50 test sample. 100 ms/test Continuous	DTC Type B
DISTRIBUTOR IGNITION SYSTEM - HIGH RES PULSE LOSS	P0372	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 test failures in a 100 test sample. 100 ms/test Continuous	DTC Type A

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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EGR SYSTEM (LOW DELTA MAP DETECTED)	P0400	MAP change > 1 Kpa. A change in EGR flow results in a change in MAP.	The EGR valve is closed for 1.5 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 solenoid control circuit DTC's MAP > 24 KPa ECT > 20°C Vehicle Speed > 19 MPH BARO > 60 KPa Engine Speed > 500 rpm Delta Idle Control < 3 steps Delta MAP < 1 KPa before test start The vehicle must meet stable operation criteria for 1.0 - 2.0 seconds. <u>CRUISE:</u> Throttle position > 5% but < 20% Delta Throttle < 1% Compensated MAP > 20 KPa but < 60 Kpa Stabilization before and during the test is required. Duration 1.5 seconds.	1.0 - 2.0 seconds 4 tests per trip after battery disconnect and then one test per trip thereafter.	DTC TYPE A
EGR VACUUM CONTROL SIGNAL SOLENOID VALVE CKT MALF (ODM)	P0403	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.	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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AIR INJECTION SYSTEM	P0410	**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 EVAP DTC set. O2 mid bias volt test passed. Engine run > 2 sec. 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 > 11V 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 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	DTC Type B
AIR INJECTION SYSTEM RELAY CONTROL CKT MALF (ODM)	P0412	Circuit Continuity 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.	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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BANK 1 CATALYTIC CONVERTER LOW OXYGEN STORAGE	P0420	Comparing rear O2 sensor signal amplitude to the front O2 sensor signal amplitude thereby measuring the oxygen storage capability of the catalytic converter.	Rear O2 amplitude approaches a calibrated threshold (approx. 90% of front O2 amplitude)	Catalyst predicted temperature ≥ 430°C Δ engine load < 2% ECT > 51°C 20 mph < vehicle speed < 75 mph TPS > 2% Engine Speed < 3500 rpm 15 g/s < Air flow < 100 g/s 25 kPa < MAP < 80 kPa Closed loop	50 acceptable O2 samples collected at a 12.5 ms rate. Once per trip	DTC Type A
BANK 2 CATALYTIC CONVERTER LOW OXYGEN STORAGE	P0430	Comparing rear O2 sensor signal amplitude to the front O2 sensor signal amplitude thereby measuring the oxygen storage capability of the catalytic converter.	Rear O2 amplitude approaches a calibrated threshold (approx. 90% of front O2 amplitude)	Catalyst predicted temperature ≥ 430°C Δ engine load < 2% ECT > 51°C 20 mph < vehicle speed < 75 mph TPS > 2% Engine Speed < 3500 rpm 15 g/s < Air flow < 100 g/s 25 kPa < MAP < 80 kPa Closed loop	50 acceptable O2 samples collected at a 12.5 ms rate. Once per trip	DTC Type A
EVAP VACUUM SWITCH CKT LOW (DURING PURGE)	P0441	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 > 60% Manif. Vac. > 16 & <150 cts. TP < 50% Engine RPM > 800 but < 3000	For 5 test failures Continuous	DTC Type B
EVAP CANISTER PURGE SOLENOID VALVE CKT (ODM)	P0443	Circuit Continuity 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 > 600 rpm.	25 seconds. continuous.	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

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VEHICLE SPEED SENSOR SYSTEM PERFORMANCE (MANUAL TRANS)	P0500	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 test failures in a 255 test sample 100 ms/test Continuous	DTC Type B
IDLE CONTROL SYSTEM LOW ENGINE SPEED	P0506	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 conditions met **Intrusive:** Once after passive test indicates a low idle condition exists	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

Sensed Parameter	FAULT CODE	Monitor Strategy Description	Malfunction Criteria &Threshold Value (s)	Secondary Parameters & Enable Conditions	Time Required & Frequency	MIL Illum. Type
IDLE CONTROL SYSTEM HIGH ENGINE SPEED	P0507	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 conditions met **Intrusive:** Once after passive test indicates a high idle condition exists	DTC Type B
PCM - FLASH EEPROM CHECKSUM ERROR	P0601	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 at power up.	DTC Type A
O2S SYSTEM - TOO FEW O2S R/L AND L/R SWITCHES (BANK 1, SENSOR 1)	P1133	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 1short term fuel trim operating. A/F = 14.7	100 seconds, once per key cycle	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

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Sensed Parameter	FAULT CODE	Monitor Strategy Description	Malfunction Criteria &Threshold Value (s)	Secondary Parameters & Enable Conditions	Time Required & Frequency	MIL Illum. Type
O2S SYSTEM - TOO FEW O2S R/L AND L/R SWITCHES (BANK 2, SENSOR 1)	P1153	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	100 Seconds, once per key cycle	DTC TYPE B
IGNITION CONTROL CKT HIGH	P1351	Circuit Continuity This diagnostic will determine if a failure has occurred due to an open circuit.	EST Voltage > 4.61 volts	EST open test enabled	Every firing cylinder event.	DTC Type A
IGNITION CONTROL CKT LOW	P1361	Circuit Continuity This diagnostic will determine if a failure has occurred due to a grounded circuit.	Delta EST feedback pulse accumulator < 8 pulse counts	EST grounded test enabled	Every firng cylinder event.	DTC Type A
DISTRIBUTOR IGNITION SYSTEM - LOW RES PULSE LOSS	P1371	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)]	Low Res. failure test enabled	20 test failures in a 30 test sample. 100 ms/test Continuous	DTC Type A
EVAP VACUUM SWITCH CKT HIGH (DURING NON-PURGE)	P1441	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 KPA & < 75 KPA TP > 0% & < 50% Engine RPM > 800 but < 3000	For 5 test failures Continuous	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

97c57P_F__yE.doc

Sensed Parameter	FAULT CODE	Monitor Strategy Description	Malfunction Criteria &Threshold Value (s)	Secondary Parameters & Enable Conditions	Time Required & Frequency	MIL Illum. Type
IDLE AIR CONTROL VALVE CKT LOW	P1508	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 > 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 conditions met **Intrusive:** Once after passive test indicates a low idle condition exists	DTC Type B

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

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Sensed Parameter	FAULT CODE	Monitor Strategy Description	Malfunction Criteria &Threshold Value (s)	Secondary Parameters & Enable Conditions	Time Required & Frequency	MIL Illum. Type
IDLE AIR CONTROL VALVE CKT HIGH	P1509	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 conditions met **Intrusive:** Once after passive test indicates a high idle condition exists	DTC Type B
TRACTION CONTROL CKT ACTIVE TOO LONG IN P/N	P1572	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	DTC Type A
PRIMARY COOLING FAN RELAY CONTROL CKT MALF (ODM)	P1641	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.	DTC Type A
SECONDARY COOLING FAN RELAY CONTROL CKT MALF (ODM)	P1642	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 commaned "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.	DTC Type A

1997 5.7L (LT1) F-car ENGINE DIAGNOSTIC PARAMETERS

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Sensed Parameter	FAULT CODE	Monitor Strategy Description	Malfunction Criteria &Threshold Value (s)	Secondary Parameters & Enable Conditions	Time Required & Frequency	MIL Illum. Type
2ND AND 3RD GEAR BLOCKOUT RELAY CKT MALF (ODM)	P1657	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.	DTC Type A
MALFUNCTION INDICATOR LAMP CKT MALF (ODM)	P1661	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.	DTC Type A