

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|--|------------|--|---|---|---|-----------------------|
| MAF Sensor Range/Perf | P0101 | 0 to 231gps 1500HZ to 10500HZ | Delta of 15 to 30 gps between the actual airflow and calculated airflow | Delta TPS < 1.50 % EGR < 50.00 % 9.00 V < ign voltage < 16.00 V Engine stable = 0.50 sec | 395.00 test failures out of 400.00 tests | DTC Type A |
| MAF Sensor Circuit Low Input | P0102 | 0 to 231gps 1500HZ to 10500HZ | Frequency value < 1200.20 HZ | RPM > 50.00 Ign voltage > 8.00 V Conditions stable > 0.50 sec TPS < 50.00 % | 395.00 test failures out of 400.00 tests | DTC Type A |
| MAF Sensor Circuit High Input | P0103 | 0 to 231gps 1500HZ to 10500HZ | Frequency value > 11500.00 HZ | RPM > 50.00 Ign voltage > 8.00 V Conditions stable > 0.50 sec TPS < 50.00 % | 395.00 test failures out of 400.00 tests | DTC Type A |
| MAP Sensor Circuit - Low Input | P0107 | This DTC detects a continuous short to low or open in either the signal circuit or the MAP sensor. | Raw MAP < 5.00 counts (12.199 kpa / 0.098 volt) | No TP sensor DTC's set Engine Running Throttle Position ≥ 0.00 % when Engine speed is ≤ 1000.00 RPM or Throttle Position is ≥ 10.00 % when Engine speed is > 1000.00 RPM | 175.00 test failures within a 200.00 test sample. 12.5ms loop Continuous | DTC Type B |
| MAP Sensor Circuit - High Input | P0108 | This DTC detects a continuous short to high in either the signal circuit or the MAP sensor. | Raw MAP > 215.00 counts (89.69 kpa / 4.22 volts) | No TP sensor DTC's set Engine Running Throttle Position ≤ 1.99 % when Engine speed is ≤ 900.00 RPM | 175.00 test failures within a 200.00 test sample. 12.5ms loop Continuous | DTC Type B |
| Intake Air Temp. Sensor Circuit -Low Input | P0112 | The DTC detects a continuous short to ground in the IAT signal circuit or the IAT sensor | Low Resistance Pull-up Raw IAT < 7.00 counts (135 °C) High Resistance Pull-up Raw IAT < 7.00 counts (135 °C) | No VS sensor DTCs set. No ECT sensor DTCs set Vehicle speed ≥ 25.00 mph Engine run time > 10.00 seconds | 175.00 test failures within a 200.00 test sample Continuous | DTC Type B |
| Intake Air Temp. Sensor Circuit - High Input | P0113 | The DTC detects a continuous open or short to high in the IAT signal circuit or the IAT sensor | Low Resistance pull-up Raw IAT > 247.00 counts (-32 °C) High Resistance pull-up Raw IAT > 247.00 counts (-32 °C) | No ECT sensor DTC's set No VS sensor DTC's set Vehicle speed < 35.00 mph Air flow < 12.00 g /second Coolant > 60.00 °C Engine run time > 180.00 seconds | 175.00 test failures within a 200.00 test sample Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|--|------------|--|---|--|---|-----------------------|
| Engine Coolant Temperature Circuit Low Input | P0117 | Thermister Analog Voltage This DTC detects if the engine coolant sensor's analog voltage falls below a minimum expected value | Low Resistance Pull-up Raw ECT < 37.00 counts (140 °C) High Resistance Pull-up Raw ECT < 37.00 counts (140 °C) | Engine run time > 15.00 seconds | 240.00 test failures within a 250.00 test sample Continuous | DTC Type B |
| Engine Coolant Temperature Circuit High Input | P0118 | Thermister Analog Voltage The DTC detects if the engine coolant sensor's analog voltage exceeds a maximum expected value | Low Resistance pull-up Raw ECT > 247.00 counts (-40 °C) High Resistance pull-up Raw ECT > 247.00 counts -40 °C) | Engine run time > 3.00 seconds | 240.00 test failures within a 250.00 test sample Continuous | DTC Type B |
| Throttle Position Sensor Circuit Range/Rationality | P0121 | The DTC detects a "skewed" or stuck TP sensor | The last throttle position value > or < predicted throttle position. Lookup table for stuck high or low based on engine RPM. | No TP sensor DTC's set or failures flagged No MAP sensor DTC's set Engine Running MAP < 50.00 kpa (stuck high) MAP > 70.00 kpa (stuck low) TP sensor Δ < 1.99 % | 95.00 test failures within 100.00 test sample or 95.00 test failures within a 100.00 test sample Continuous | DTC Type A |
| Throttle Position Sensor Circuit-Low Input | P0122 | This DTC detects a continuous short to low or open in either the signal circuit or the TP sensor. | Raw TP sensor signal < 5.00 counts (1.95% of reference voltage / 0.098 volt) | Engine running | 95.00 consecutive test failures within a 100.00 test sample Continuous | DTC Type A |
| Throttle Position Sensor Circuit-High Input | P0123 | This DTC detects a continuous short to high in either the signal circuit or the TP sensor. | Raw TP sensor signal > 250.00 counts (97.66% of reference voltage / 4.9 volts) | Engine running | 95.00 consecutive test failures within a 100.00 test sample Continuous | DTC Type A |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|---|------------|---|--|--|---|-----------------------|
| Insufficient Coolant Temperature for Closed Loop Fuel Control | P0125 | Thermistor Analog Voltage This DTC detects if a stabilized minimum closed-loop coolant temperature is reached and maintained after engine start-up | If closed-loop timer is exceeded: 6.00 sec @ 50 °F 154.00 sec @ 20 °F 287.00 sec @ region 3 ECT < 10.00 °C | ECT sensor shorts test not failing ECT DTCs not active IAT sensor DTCs not active Start up ECT ≤ 40.00 °C IAT ≥ -6.99 °C ECT ≥ -40.00 °C Max Idle Time ≤ : 5.00 sec @ 50 °F 120.00 sec @ 20 °F 225.00 sec @ Reg 3 Min Total Engine Air ≥ : 676.00 grams @ 50 °F 2068.00 grams @ 20 °F 3438.00 grams @ Reg 3 | 80.00 consecutive test failures (i.e. test failures * loop rate = sec) 100ms loop Continuous | DTC Type B |
| O2S Circuit-Low Voltage(Bank 1, Sensor 1) | P0131 | This DTC determines if the O2 sensor or circuit is shorted to low by checking for a lean condition during steady throttle and PE. | O2 sensor voltage < 175.01 millivolts or O2 sensor voltage < 599.99 millivolts in PE mode | No misfire DTC's No crank DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Closed loop Air/Fuel ratio ≥ 14.50 but ≤ 14.80 Throttle position > 40.00 % but < 3.01 % | 90.00 test failures in a 100.00 test sample for 5.00 sets of samples 550.00 failures in a 600.00 test sample for PE mode | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|---|------------|---|--|---|--|-----------------------|
| O2S Circuit-High Voltage(Bank 1, Sensor 1) | P0132 | This DTC determines if the O2 sensor or circuit is shorted to high by checking for a rich condition during steady throttle and DFCO | O2 sensor voltage > 975.00 millivolts or O2 sensor voltage > 200.00 millivolts in DFCO mode | No misfire DTC's No crank sensor DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Closed loop Air/Fuel ratio ≥ 14.50 but ≤ 14.80 Throttle position > 3.01 % but < 40.00 % | 90.00 test failures in a 100.00 test sample for 5.00 sets of samples. 290.00 failures in a 300.00 test sample for DFCO mode | DTC Type B |
| O2S Circuit-Slow Response(Bank 1, Sensor 1) | P0133 | This DTC determines if the O2 sensor functioning properly by checking its response time. | O2 sensor average transition time: L/R > 139.84 msec R/L > 107.03 msec | No misfire DTC's No crank sensor DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Coolant temp > 50.00 C 1000.00 < RPM < 3000.00 10.00 gps < MAF < 30.00 gps | 60.00 seconds after closed loop enable Once per key cycle | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|--|------------|---|--|---|--|-----------------------|
| O2S Circuit-No Activity Detected (Bank 1,Sensor 1) | P0134 | This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open. | O2 sensor > 400.00 millivolts but < 499.99 millivolts | No misfire DTC's No crank sensor DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Engine run time > 200.00 seconds | 290.00 test failures in a 300.00 test sample Continuous | DTC Type B |
| O2S Heater Circuit Malfunction (Bank 1, Sensor 1) | P0135 | This DTC determines if the O2 sensor heater is functioning properly by monitoring the amount of time necessary for the O2 sensor to become active after start - up. | The elapsed time to obtain \pm 150 millivolts from the mean O2 bias voltage. *Time based on table: Time vs Start Up Coolant Temp. | No misfire DTC's No crank sensor DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's ECT < 35.00 °C IAT < 35.00 °C Δ ECT-IAT \leq 6.02 °C Avg MAF < 18.00 gps 9.00 < System Voltage < 16.00 Avg Bias | From cold start to a run time maximum of 85 seconds. *Time determined by table. | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|---|------------|---|---|---|--|-----------------------|
| O2S Circuit-Low Voltage(Bank 1, Sensor 2) | P0137 | This DTC determines if the O2 sensor or circuit is shorted to low by checking for a lean condition during steady throttle and PE. | O2 sensor voltage < 10.00 millivolts or O2 sensor voltage < 599.99 millivolts in PE mode | No misfire DTC's No crank sensor DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Closed loop Air/Fuel ratio ≥ 14.50 but ≤ 14.80 Throttle position > 3.01 % but < 40.00 % | 560.00 test failures in a 600.00 test sample for 4.00 sets of samples 900.00 failures in a 1000.00 test sample for PE mode | DTC Type B |
| O2S Circuit-High Voltage(Bank 1, Sensor 2) | P0138 | This DTC determines if the O2 sensor or circuit is shorted to high by checking for a rich condition during steady throttle and DFCO | O2 sensor voltage > 999.99 millivolts or O2 sensor voltage > 200.00 millivolts in DFCO mode | No misfire DTC's No crank sensor DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Closed loop Air/Fuel ratio ≥ 14.50 but ≤ 14.80 Throttle position > 3.01 % but < 40.00 % | 560.00 test failures in a 600.00 test sample for 4.00 sets of samples. 900.00 failures in a 1000.00 test sample for DFCO mode | DTC Type B |
| O2S Circuit-No Activity Detected (Bank 1, Sensor 2) | P0140 | This DTC determines if the O2 sensor or the O2 sensor circuit has developed an open. | O2 sensor > 424.99 millivolts but < 475.00 millivolts | No misfire DTC's No crank sensor DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's Engine run time > 200.00 seconds | 900.00 test failures in a 1000.00 test sample Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|---|------------|---|--|--|---|-----------------------|
| O2S Heater Circuit Malfunction (Bank 1, Sensor 2) | P0141 | This DTC determines if the O2 sensor heater is functioning properly by monitoring the amount of time necessary for the O2 sensor to become active after start - up. | The elapsed time to obtain ± 150 millivolts from the mean O2 bias voltage. *Time based on table: Time vs Start Up Coolant Temp. | No misfire DTC's No crank sensor DTC's No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's ECT < 35.00 °C IAT < 35.00 °C Δ ECT-IAT \leq 6.02 °C Avg MAF < 24.00 gps 9.00 < System Voltage < 16.00 Avg Bias | From cold start to a maximum time of 115 seconds. *Time determined by table. | DTC Type B |
| System Too Lean (Bank 1) | P0171 | Determines if the system is in a lean condition. | The average of short term fuel trim samples ≥ 1.07 and The average of adaptive index multiplier samples ≥ 1.16 | The following DTC's are not set: VSS DTCs EST DTCs Crank sensor DTCs CAM sensor DTCs TPS DTC's Misfire DTC's IAC DTC's Injector DTC's MAF DTC's O2 sensor DTC's MAP DTC's EGR DTC's Evap. DTC's ECT DTC's IAT DTC's Throttle position < 90.00 % Engine speed > 600.00 rpm but < 4000.00 rpm Baro > 70.00 kpa (8500 ft) ECT > 20.00 °C but < 110.00 °C MAP > 15.00 kpa but < 85.00 kpa IAT > -18.01 °C but < 70.00 °C Air flow > 3.00 g/s < 150.00 g/s Vehicle speed < 82.00 mph | If lean counter is ≥ 5.00 tests Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|-------------------------------------|------------|--|--|--|--|-----------------------|
| System Too Rich (Bank 1) | P0172 | Determines if the system is in a rich condition. | The average of short term fuel trim samples ≤ 0.98 and The average of adaptive index multiplier samples ≤ 0.86 | The following DTC's are not set: VSS DTCs EST DTCs Crank sensor DTCs CAM sensor DTCs TPS DTC's Misfire DTC's IAC DTC's Injector DTC's MAF DTC's O2 sensor DTC's MAP DTC's EGR DTC's Evap. DTC's ECT DTC's IAT DTC's Throttle position $< 90.00\%$ Engine speed > 600.00 rpm but < 4000.00 rpm Baro > 70.00 kpa (8500 ft) ECT > 20.00 °C but < 110.00 °C MAP > 15.00 kpa but < 85.00 kpa IAT > -18.01 °C but < 70.00 °C Air flow > 3.00 g/s < 150.00 g/s Vehicle speed < 82.00 mph | If lean counter is ≥ 5.00 tests Continuous | DTC Type B |
| Injector Circuit Fault - Cylinder 1 | P0201 | This DTC checks the injectors for electrical integrity | Output state is invalid | PCM state = run | 5 seconds 1 second loop Continuous | DTC Type B |
| Injector Circuit Fault - Cylinder 2 | P0202 | This DTC checks the injectors for electrical integrity | Output state is invalid | PCM state = run | 5 seconds 1 second loop Continuous | DTC Type B |
| Injector Circuit Fault - Cylinder 3 | P0203 | This DTC checks the injectors for electrical integrity | Output state is invalid | PCM state = run | 5 seconds 1 second loop Continuous | DTC Type B |
| Injector Circuit Fault - Cylinder 4 | P0204 | This DTC checks the injectors for electrical integrity | Output state is invalid | PCM state = run | 5 seconds 1 second loop Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|---|------------|---|--|---|---|---|
| Injector Circuit Fault - Cylinder 5 | P0205 | This DTC checks the injectors for electrical integrity | Output state is invalid | PCM state = run | 5 seconds 1 second loop Continuous | DTC Type B |
| Injector Circuit Fault - Cylinder 6 | P0206 | This DTC checks the injectors for electrical integrity | Output state is invalid | PCM state = run | 5 seconds 1 second loop Continuous | DTC Type B |
| Random Misfire Detected | P0300 | This DTC will determine if a misfire is occurring by monitoring crankshaft velocity. | Deceleration index vs Engine Speed vs Load and Camshaft Position | Engine run time > 0-5 sec depending on start up RPM No VSS DTC's No crank sensor DTC's No TP sensor DTC's No MAP sensor DTC's No ECT sensor DTC's No CAM sensor DTCs No mass airflow sensor DTCs Fuel cutoff not active Brake torque management not active Fuel level > 10% ECT > -6.02 °C but < 120.00 ° C Engine speed > 550.00 RPM but < 5850.00 RPM System voltage > 9.00 volts but < 16.00 volts + Throttle position Δ < 6.25 % / 100ms - Throttle position Δ < 1.56 %/100ms Rough Road- Ratio of consecutive positive peak delta ref times to nonconsecutive peaks. | 5 failed 200 revolution blocks out of 16 Emission Level 1 failed 200 revolution block Catalyst damaging Level Continuous | DTC Type B <i>EMISSION</i> DTC Type A CATALYST DAMAGING |
| Crankshaft Position Sensor Circuit-Range/Perf | P0336 | 18X Signal This diagnostic will detect an incorrect signal from the crankshaft sensor. | If 36 med. res. pulses are not seen in one engine cycle | Engine run time > 3.00 sec 3X crank signal present | 290.00 ref pulse failures within 300.00 sample limit. Continuous | DTC Type B |
| Camshaft Position Sensor Circuit Range/Perf | P0341 | 1X Signal This diagnostic will detect if the Cam Sensor signal is present. | Engine Running Cam Sensor reference pulse is not seen once every 6 cylinder events. | ----- | If Cam signal is not detected 290.00 out of 300.00 test samples. Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|--|------------|---|---|---|---|-----------------------|
| Exhaust Gas Recirculation - Insufficient Flow Detected | P0401 | This diagnostic will determine if there is a reduction in EGR flow. | With EGR valve open, the peak + MAP Δ is monitored over a period of time. This value is compared with a threshold from Engine Speed vs Baro table and the difference computed. The result is statistically filtered (EWMA) and compared to a decision limit. DTC is set when the filtered result exceeds the decision limit. | <p>Test Enable</p> No injector DTCs set No crank DTCs set No TP sensor DTC's set No MAP DTC's set No VS sensor DTC's set No IAT sensor DTC's set No ECT sensor DTC's set No IAC DTC's set No Linear EGR Pintle Position DTC set No Misfire DTC's set No MAF DTC's set MAP Δ < 1.50 kpa - RPM Δ < 300 + RPM Δ < 100 MPH Δ < 5.00 ECT > 75.00 ° C Baro > 105.00 kpa (9000 ft) Vehicle Speed > 25.00 mph IAC Δ < 10.00 counts AC clutch status is unchanged Transmission status is unchanged <p>Start Test</p> Throttle Position < 1% EGR Position < 1% Engine Speed > 1400.00 rpm but < 1400.00 rpm MAP Δ < 1.50 kPa Compensated MAP > 10.00 kpa but < 50.00 kpa <p>Run Test</p> Stabilized MAP (valve closed) recorded and EGR valve "ramped" open over a time interval and peak MAP value recorded and MAP Δ computed. EGR valve "ramped" closed over a time interval. | 1 second Once per trip | DTC Type A |
| Linear EGR Circuit Fault | P0403 | This DTC checks the Linear EGR circuit for electrical integrity | Output state invalid | PCM state = crank or run | 20.00 seconds 100ms loop Continuous | DTC Type B |
| EGR Valve Circuit Performance | P0404 | This diagnostic detects if the pintle position error is too large | Pintle position error [absolute value of (desired position - actual position)] > 15.00 % | Desired EGR position > 0% Code P0401 status = not in progress EGR valve icing or over temperature not occurring Δ Desired EGR position < 30.00 % Ignition voltage \geq 10.00 volts | 200.00 loops 100ms loop Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|---|------------|--|---|---|--|-----------------------|
| EGR Valve Position Sensor Circuit Low Voltage | P0405 | This diagnostic detects if the pintle position feedback circuit is open or shorted to ground | EGR feedback sensor signal < 7.00 counts | EGR valve icing or over temperature not occurring Ignition voltage ≥ 10.00 volts | 20.00 seconds 100ms loop Continuous | DTC Type B |
| Catalyst Low Efficiency Bank 1 | P0420 | Oxygen Storage | OSC time difference ≥ 0.089 seconds OSC time difference = OSC worst pass threshold - OSC compensation factor * (post cat O2 resp time - pre cat O2 resp time) OSC worst pass thresh = 1.325 seconds | No EST DTC's set No EGR DTC's set No MAT DTC's set No IAC DTC's set No injector DTC's set No VS sensor DTC's set No TP sensor DTC's set No O2 sensor DTC's set No Misfire DTC's set No MAP sensor DTC's set No Fuel Trim DTC's set No ECT sensor DTC's set <u>Valid Idle Period Criteria</u> Engine speed ≥ 1100 RPM for a minimum of 600.00 sec since end of last idle period. Min engine run time for stable BLM <u>Test Enable Conditions</u> Predicted catalyst temperature ≥ 400.00 Closed loop fuel control Barometric pressure ≥ 75.00 kpa -20.00 ≤ IAT ≤ 100 °C 75.00 ≤ ECT ≤ 123.98 °C 0 < Idle period ≤ 60.00 seconds Tests attempted this trip ≤ 6.00 Delta engine speed ≤ 123 RPM | 1 test attempted per valid idle period Maximum of 6 tests per trip until catalyst I/M flag set Maximum of 1 test per trip after I/M flag set. Frequency: 15.6 ms continuous | Type A |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 Control System - Malfunction | P0440 | This diagnostic will detect a missing gas cap or a "gross" leak in the evap system. | Evap leak > 0.080" | No MAT DTC's set No MAP DTC's set No TP sensor DTC's set No Air flow DTC's set No O2 DTC's set No VSS DTC's set No Misfire DTC's set No Fuel Trim/Fuel Injector DTC's set No EGR DTC's set No Coolant DTC's set No AIR DTC's set Baro > 75.20 kPa (8000 ft) 4.41 ° ≤ Powerup ECT ≤ 30.00 °C 4.41 ° ≤ Powerup IAT ≤ 30.00 °C ECT-IAT no more than 8.01 °C IAT-ECT no more than 1.99) °C 15.00 % < Fuel Level < 85.10 % 5.00 V < System Voltage < 16.00 V | Test runs once per cold trip if all conditions are met. Test begins at 180s after start and ends when tank vacuum reaches 7.9" H2O or timer expires (37.5s). | DTC Type A |
| Evap. Emission System Leak Detection | P0442 | This diagnostic will detect a small leak in the evap system. Test begins after "gross" leak test and monitors the vacuum decay in the system. If vacuum decay slope exceeds threshold, system monitors for fuel vapor generation | Evap system leak between 0.040" and 0.080" | No MAT DTC's set No MAP DTC's set No TP sensor DTC's set No Air flow DTC's set No O2 DTC's set No VSS DTC's set No Misfire DTC's set No Fuel Trim/Fuel Injector DTC's set No EGR DTC's set No Coolant DTC's set No AIR DTC's set Baro > 75.20 kPa (8000 ft) 4.41 ° ≤ Powerup ECT ≤ 30.00 °C 4.41 ° ≤ Powerup IAT ≤ 30.00 °C ECT-IAT no more than 8.01 °C IAT-ECT no more than 1.99) °C 15.00 % < Fuel Level < 85.10 % 5.00 V < System Voltage < 16.00 V | Test runs once per cold trip if all conditions are met. Test begins after "gross" leak test and monitors the vacuum decay in the system. If vacuum decay slope is too great, system monitors for fuel vapor generation. | DTC Type A |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 Control System - Air Vent Circuit Fault | P0446 | This diagnostic will detect a blockage in the evap system which would keep the system from venting. Test begins after small leak test and monitors tank vacuum for a period of time. | Tank Vacuum > 10" H2O | | Test runs once per cold trip if all conditions are met. Test begins after small leak test and monitors tank vacuum for a period of time. If tank vacuum exceeds 10" H2O (11" H2O in H-car) for 4 seconds, test fails. | DTC Type A |
| Evap. Emission Control System - Fuel Tank Pressure Sensor Circuit Low | P0452 | This diagnostic will detect a fuel tank pressure sensor short circuit. | Fuel tank Pressure sensor | Evap diagnostic is enabled | Fails if tank pressure sensor signal fails low for 5 consecutive seconds. Continuous | DTC Type B |
| Evap. Emission Control System - Fuel Tank Pressure Sensor Circuit High | P0453 | This diagnostic will detect a fuel tank pressure sensor open ... | Fuel tank Pressure sensor | Evap diagnostic is enabled | Fails if tank pressure sensor signal fails high for 5 consecutive seconds. Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|---|------------|--|---|--|---|-----------------------|
| Idle Control System RPM Lower Than Expected | P0506 | This DTC will determine if a low idle is the result of a IAC valve or circuit. A low idle is defined as 175 RPM below the desired idle. (Desired RPM range 725 to 800) | Engine speed < (Desired RPM -100) | <u>Test Enable:</u> No CCP DTC's set No misfire DTC's set No EGR DTC's set No TP sensor DTC's set No VS sensor DTC's set No ECT DTC's set No MAP DTC's set No IAT DTCs set No Fuel Trim DTC's set No Injector DTCs set No Crank sensor DTCs set No MAF DTC's set ECT > 70.00 °C System Voltage > 9.00 V but < 16.00 V IAT > -18.01 °C Engine run time > 120.00 seconds Baro > 65.00 kPa (12000 ft) TP < 1.31 % VS < 3.00 MPH Above met for a time > 15.00 seconds to enable diagnostic. | 15.00 seconds Continuos after enable | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|--|------------|--|---|---|--|-----------------------|
| Idle Control System RPM Higher Than Expected | P0507 | This DTC will determine if a high idle is the result of a IAC valve or circuit. A high idle is defined as 275 RPM above the desired idle. (Desired RPM range 725 to 800) | Engine speed > (Desired RPM + 175) | <u>Test Enable:</u> No CCP DTC's set No misfire DTC's set No EGR DTC's set No TP sensor DTC's set No VS sensor DTC's set No ECT DTC's set No MAP DTC's set No IAT DTCs set No Fuel Trim DTC's set No Injector DTCs set No Crank sensor DTCs set No MAF DTC's set ECT > 70.00 °C System Voltage > 9.00 V but < 16.00 V IAT > -18.01 °C Engine run time > 120.00 seconds Baro > 65.00 kPa (12000 ft) TP < 1.31 % VS < 3.00 MPH Above met for a time > 15.00 seconds to enable diagnostic. | 15.00 seconds Continuous after enable | DTC Type B |
| Check Sum Error | P0601 | This DTC will be stored if the calibration check sum is incorrect | Output state invalid | PCM state = crank or run | Within 2 seconds at Powerup; background checksum after power up 50 ms loop Continuous | DTC Type B |
| PCM Programming Error | P0602 | This DTC will be stored if the PCM has been replaced and has not been programmed | Output state invalid | PCM state = crank | Test is run at Powerup 100ms loop Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|---|------------|---|---|---|---|-----------------------|
| O2 Sys. Fault - Too Few O2S R/L or L/R Switches, Insufficient Activity (Bank 1, Sensor 1) | P1133 | This DTC determines if the O2 sensor functioning properly by monitoring the number of L/R and R/L switches. | Number of switches in 100.00 seconds: L/R switches < 40.00 R/L switches < 40.00 O2 voltage between 300.00 millivolts and 599.99 millivolts | No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's DTC P0135 (O2 Heater) not set Closed loop | 100.00 seconds after closed loop enable Once per key cycle | DTC Type B |
| O2S Incorrect Ratio (Bank 1, Sensor 1) | P1134 | This DTC diagnoses degraded slow rich to lean or lean to rich response times. | Ratio of average response times. Ratio > 4.50 or < 0.50 O2 voltage between 300.00 V and 599.99 V | No injector DTC's No MAF DTC's No TP sensor DTC's No Evap. DTC's No IAT sensor DTC's No MAP DTC's No Fuel trim DTC's No EGR DTC's No ECT sensor DTC's DTC P0135 (O2 Heater) not set Closed loop | 100.00 seconds after closed loop enable Once per key cycle | DTC Type B |
| Crank Angle Sensor Learned Error | P1336 | The DTC will determine if the matching tolerance in the crankshaft system has been learned by the vehicle | Sum of compensation factors not within range | PCM state = run | 0.50 sec 100ms loop continuous | DTC type A |
| EST Open Circuit Fault | P1351 | This DTC checks the EST circuit for electrical integrity | Voltage state invalid | PCM state = crank or run | 290.00 failures within 300.00 Every engine cycle Continuous | DTC Type B |
| EST Short Circuit Fault | P1352 | This DTC checks the EST circuit for electrical integrity | Voltage state invalid | PCM state = crank or run | 290.00 failures within 300.00 Every engine cycle Continuous | DTC Type B |
| Bypass Open Circuit Fault | P1361 | This DTC checks the Bypass circuit for electrical integrity | Voltage state invalid | PCM state = crank or run | 290.00 failures within 300.00 Every engine cycle Continuous | DTC Type B |

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|--|------------|--|--|--|--|-----------------------|
| Bypass Short Circuit Fault | P1362 | This DTC checks the Bypass circuit for electrical integrity | Voltage state invalid | PCM state = crank or run | 290.00 failures within 300.00 Every engine cycle Continuous | DTC Type B |
| Crank to Low Res Correlate | P1374 | Pulsed 0V to 10V | 3X signal 18X signal | Engine runtime > 3.00 sec Incorrect number of 3X signals per engine cycle | 290.00 out of 300.00 test samples Continuous | DTC Type B |
| EGR Valve Circuit Performance - Actual Position > Commanded Position | P1404 | This diagnostic detects if the valve is stuck open when commanded closed. | Actual pintle position > 10.00 counts from closed position | EGR valve icing or over temperature not occurring Ignition voltage ≥ 10.00 volts | 2.00 separate failures for 20.00 seconds (with pintle movement > 40.00 % for 0.5 seconds opening time between tests) 100ms loop Continuous | DTC Type B |
| Evap. Emission Control System Open Purge Flow | P1441 | This diagnostic will detect a purge solenoid stuck open. Test begins after Vent Circuit test and monitors tank vacuum after the system is sealed. | Tank Vacuum > 11" H2O within 25 sec | No MAT DTC's set No MAP DTC's set No TP sensor DTC's set No Air flow DTC's set No O2 DTC's set No VSS DTC's set No Misfire DTC's set No Fuel Trim/Fuel Injector DTC's set No EGR DTC's set No Coolant DTC's set No AIR DTC's set Baro > 75.20 kPa (8000 ft) 4.41 ° ≤ Powerup ECT ≤ 30.00 °C 4.41 ° ≤ Powerup IAT ≤ 30.00 °C ECT-IAT no more than 8.01 °C IAT-ECT no more than 1.99) °C 15.00 % < Fuel Level < 85.10 % 5.00 V < System Voltage < 16.00 V | Test runs once per cold trip if all conditions are met | DTC Type B |
| V5BA Voltage Circuit Fault | P1635 | 5 Volts | Voltage state invalid | PCM state = run | 10.00 sec 100ms loop Continuous | DTC Type B |
| Fan 1 Relay Circuit Fault | P1651 | This DTC checks the output driver for electrical integrity | Output state invalid | PCM state = crank or run | 30 sec Continuous | DTC Type B |

98c38K_CFHWE.DOC

1998 3.8L (L36) non-supercharged C-car, F-car, H-car, W-car ENGINE DIAGNOSTIC PARAMETERS

98c38K_CFHWE.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 |
|------------------------------|------------|--|---|--|---------------------------|-----------------------|
| Fan 2 Relay Circuit Fault | P1652 | This DTC checks the output driver for electrical integrity | Output state invalid | PCM state = crank or run | 30 sec Continuous | DTC Type B |
| Canister Purge Circuit Fault | P1676 | This DTC checks the output driver for electrical integrity | Output state invalid | PCM state = crank or run | 30 sec Continuous | DTC Type B |
| Fuel Tank Vent Circuit Fault | P1665 | This DTC checks the output driver for electrical integrity | Output state invalid | PCM state = crank or run | 30 sec Continuous | DTC Type B |