

Symptom:
P0172-FUEL SYSTEM 1/1 RICH

When Monitored and Set Condition:

P0172-FUEL SYSTEM 1/1 RICH

When Monitored: With the engine running in closed loop mode, the ambient/battery temperature above 20°F(-7°C) and altitude below 8500 ft.

Set Condition: If the PCM multiplies short term compensation by long term adaptive and a purge fuel multiplier and the result is below a certain value for 30 seconds over trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored.

POSSIBLE CAUSES

GOOD TRIP EQUAL TO ZERO
 O2 SENSOR HEATER OPERATION
 O2 SENSOR
 EVAP PURGE SOLENOID OPERATION
 O2 SIGNAL CIRCUIT
 O2 RETURN CIRCUIT
 MAP SENSOR OPERATION
 ECT SENSOR OPERATION
 ENGINE MECHANICAL PROBLEM
 FUEL FILTER/PRESSURE REGULATOR
 PCM

TEST	ACTION	APPLICABILITY
1	<p>NOTE: Check for contaminates that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant. Ignition on, engine not running. With the DRBIII®, read DTCs and record the related Freeze Frame data. Is the Good Trip Counter displayed and equal to zero?</p> <p>Yes → Go To 2</p> <p>No → Refer to the INTERMITTENT CONDITION symptom in the Driveability category. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.</p>	All

P0172-FUEL SYSTEM 1/1 RICH — Continued

TEST	ACTION	APPLICABILITY
2	<p>Warning: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.</p> <p>Install a fuel pressure gauge. Ignition on, engine not running. With the DRBIII®, actuate the ASD Fuel System test and observe the fuel pressure gauge. NOTE: Fuel pressure specification is 400 KPa +/- 34 KPa (58 psi +/- 5 psi). Turn the ignition off. Choose a conclusion that best matches your fuel pressure reading.</p> <p style="padding-left: 40px;">Within Specification Go To 3</p> <p style="padding-left: 40px;">Above Specification Replace the fuel filter/pressure regulator. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.</p> <p>Caution: Stop All Actuations.</p>	All
3	<p>NOTE: If one of the O2 Sensors Signal or Return circuits are shorted to ground or voltage, all the other O2 Sensor voltage readings will be affected. NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.</p> <p>Start the engine. Allow the engine to reach normal operating temperature. With the DRBIII®, read the O2 Sensor voltage. Is the voltage switching between 2.5 and 3.4 volts?</p> <p style="padding-left: 40px;">Yes → Go To 4</p> <p style="padding-left: 40px;">No → Go To 9</p>	All
4	<p>Turn the ignition off. NOTE: Allow the O2 Sensor to cool down before continuing the test. The O2 voltage should stabilize at 5.0 volts. Raising the hood may help in reducing under hood temps.</p> <p>Ignition on, engine not running. With the DRBIII®, actuate the O2 Heater Test. With the DRBIII®, monitor O2 Sensor voltage for at least 2 minutes. Does the voltage stay above 4.5 volts?</p> <p style="padding-left: 40px;">Yes → Replace the O2 Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.</p> <p style="padding-left: 40px;">No → Go To 5</p>	All
5	<p>Turn the ignition off. Disconnect the hoses at the Evap Purge Solenoid. Using a hand vacuum pump, apply 10 inches of vacuum to the Evap Purge Solenoid vacuum source port on the component side. Did the Evap Purge Solenoid hold vacuum?</p> <p style="padding-left: 40px;">Yes → Go To 6</p> <p style="padding-left: 40px;">No → Replace the EVAP Purge Solenoid. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.</p>	All

P0172-FUEL SYSTEM 1/1 RICH — Continued

TEST	ACTION	APPLICABILITY
6	Turn the ignition off. Connect a Vacuum Gauge to a Manifold Vacuum source. Start the engine. Allow the engine to idle. Note: If engine will not idle, maintain a constant RPM above idle. With the DRBIII® in Sensors, read the MAP Sensor vacuum value. Is the DRB reading within 1" of the Vacuum Gauge reading? Yes → Go To 7 No → Replace the MAP Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
7	Note: For this test to be valid, the thermostat must be operating correctly. Note: This test works best if performed on a cold engine (cold soak) Ignition on, engine not running. With the DRBIII®, read the Engine Coolant Temperature Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature. Note: If engine coolant temperature is above 82°C (180°F), allow the engine to cool until 65°C (150°F) is reached. Start the Engine. During engine warm-up, monitor the Engine Coolant Temperature value. The temp value change should be a smooth transition from start up to normal operating temp 82°C (180°F). The value should reach at least 82°C (180°F). Did the Engine Coolant Temperature value increase a smooth transition and did it reach at least 82°C Yes → Go To 8 No → Replace the Engine Coolant Temperature Sensor. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.	All
8	Check for any of the following conditions/mechanical problems. AIR INDUCTION SYSTEM - must be free from restrictions. ENGINE VACUUM - must be at least 13 inches in neutral ENGINE VALVE TIMING - must be within specifications ENGINE COMPRESSION - must be within specifications ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks. ENGINE PCV SYSTEM - must flow freely TORQUE CONVERTER STALL SPEED - must be within specifications POWER BRAKE BOOSTER - no internal vacuum leaks FUEL - must be free of contamination FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector Are there any engine mechanical problems? Yes → Repair as necessary. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC. No → Test Complete.	All

P0172-FUEL SYSTEM 1/1 RICH — Continued

TEST	ACTION	APPLICABILITY
9	<p>Ignition on, engine not running. Disconnect the O2 Sensor harness connector. With the DRBIII®, monitor the O2 Sensor voltage. The O2 Sensor voltage should read 5.0 volts on the DRBIII® with the connector disconnected. Using a jumper wire, jump from the O2 Signal circuit to the O2 Return circuit in the O2 Sensor harness connector. NOTE: The voltage should drop from 5.0 volts down to 2.5 volts with the jumper wire connected. Did the O2 Sensor voltage drop from 5 volts to 2.5 volts?</p> <p>Yes → Replace the O2 Sensor Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.</p> <p>No → Go To 10</p>	All
10	<p>Turn the ignition off. Disconnect the O2 Sensor harness connector. Turn the ignition on. Measure the voltage of the O2 Signal circuit in the O2 Sensor harness connector. Is the voltage above 4.8 volts?</p> <p>Yes → Check the O2 Signal circuit for damage, short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.</p> <p>No → Go To 11</p>	All
11	<p>Turn the ignition off. Disconnect the O2 Sensor harness connector. Turn the ignition on. Measure the voltage on the O2 Return circuit in the O2 Sensor harness connector. Is the voltage at 2.5 volts?</p> <p>Yes → NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.</p> <p>No → Check the O2 Return circuit for damage, short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 5 - NGC.</p>	All