

HF: Catalyst Efficiency Monitor and Exhaust Systems

← [HF: Introduction](#)

HF1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCs)

Are DTCs P0420 or P0430 present?

Yes	No
GO to HF2 .	For symptoms without DTCs, GO to HF6 . For all others, GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .

HF2 CHECK FOR OTHER DTCs

Note: Internal deterioration of a catalytic converter is usually caused by abnormal engine operation upstream of the catalyst. Events that can produce higher than normal temperatures in the catalyst are particularly suspect. For example, misfiring can cause higher than normal catalyst operating temperatures.

Note: Make sure the customer has not:

- refueled the vehicle with leaded gasoline.
 - noticed a high vehicle oil consumption. An engine that consumes oil at a high rate deposits high levels of phosphorus on the catalyst and reduces the catalyst efficiency.
- Carry out the self-test.

Are any DTCs present other than the following: P0420, P0430?

Yes	No
GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions for pinpoint test direction and REPAIR the other DTCs first. CLEAR the DTCs. REPEAT the self-test.	GO to HF3 .

HF3 CHECK THE ELECTRONIC ENGINE CONTROL (EEC) WIRING HARNESS

Note: Check the HO2S electrical connectors to make sure the correct HO2S is connected to the correct electrical connector. The electrical connectors are color coded to make sure the correct connection is made.

If the electrical connection of the rear HO2S are interchanged/crossed, the catalyst efficiency monitor test fails.

- Visually inspect the HO2S harness connectors for any indication of crossed wiring.
- Visually inspect the harness for exposed wiring, corrosion and correct routing.
- Visually inspect the PCM connectors for damaged, or pushed out pins, corrosion and loose wires.

Are there any concerns with the wiring or the PCM connection?

Yes	No
REPAIR as necessary. CLEAR the DTCs. CARRY OUT the catalyst monitor drive cycle to verify the repairs.	GO to HF4 .

HF4 CHECK THE FUEL PRESSURE



WARNING: THE FUEL SYSTEM REMAINS PRESSURIZED WHEN THE ENGINE IS NOT RUNNING. TO PREVENT INJURY OR FIRE, USE CAUTION WHEN WORKING ON THE FUEL SYSTEM. REFER TO THE FUEL SYSTEM WARNING INFORMATION AT THE BEGINNING OF PINPOINT TEST HC. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

Note: Fuel pressure above specification can produce an abnormally rich air/fuel mixture. This rich air/fuel mixture can cause higher than normal catalyst operating temperatures.

Note: On electronic returnless fuel system (ERFS), the fuel pressure can be monitored by the scan tool using the fuel rail pressure (FRP) PID.

- Mechanical returnless fuel systems (MRFS):
 - If applicable, inspect the vacuum hose going to the fuel rail pulse damper for proper installation and cracks. Repair as necessary.
- Connect a Rotunda fuel pressure gauge or equivalent.
- Access the PCM and monitor the FRP PID.
- Start the engine. Record the fuel pressure.
- Compare the recorded fuel pressure reading to the Fuel System Specification Chart found at the beginning of Pinpoint Test HC. GO to Pinpoint Test [HC](#).
- Ignition OFF.

Is the fuel pressure within specifications?

Yes	No
The fuel pressure is OK. If applicable, REMOVE the fuel pressure gauge. GO to HF5 .	The fuel pressure is out of specification. GO to HC3 .

HF5 CHECK FOR LEAKS IN THE EXHAUST SYSTEM

Note: If a catalyst is in series with a leaking exhaust system, it can fail the catalyst efficiency monitor test.

- Inspect the exhaust system for leaks, cracks, loose connections, punctures, or non-factory modifications.

Is a concern present?

Yes	No
REPAIR as necessary. CLEAR the DTCs. CARRY OUT the catalyst monitor drive cycle to verify the repairs.	GO to HF10 .

HF6 CHECK FOR RESTRICTIONS IN THE EXHAUST SYSTEM

Note: A slight pressure in the exhaust system is normal, but excessive exhaust back pressure seriously affects engine operation.

- Inspect the following for damage or restrictions:
 - front and rear exhaust pipes
 - catalytic converter
 - muffler and tailpipe assembly

Is a concern present?

Yes	No
REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.	GO to HF7 .

HF7 CHECK FOR EXCESSIVE EXHAUST BACK PRESSURE

- The internal condition of exhaust system and its ability to flow can be checked with an exhaust back pressure tool.

Is an exhaust back pressure tester available?

Yes	No
GO to HF8 .	GO to HF9 .

HF8 CHECK FOR EXCESSIVE EXHAUST BACK PRESSURE WITH EXHAUST BACK PRESSURE TOOL

Note: Typical exhaust back pressure, when measured near the exhaust manifold and at normal engine operating temperature, should not exceed 20.7 kPa (3 psi) at idle and 55.2 kPa (8 psi) at wide open throttle (WOT) under load.

- Install an exhaust back pressure tester and follow the tool manufacturer installation and testing instructions.

Does the exhaust back pressure test indicate a restriction?

Yes	No
REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. To continue diagnosis of a symptom (lack of power, loss of power, or no start), REFER to Section 3 Symptom Charts.	No indication of restrictions or leaks has been detected in the exhaust system. To continue diagnosis of a symptom (lack of power, loss of power, or no start), REFER to Section 3 Symptom Charts.

HF9 CHECK MANIFOLD VACUUM FOR AN INDICATION OF EXCESSIVE EXHAUST SYSTEM RESTRICTION

Note: When the engine is first started and is idled, the reading may be normal 51-74 kPa (15-22 in-Hg), but as the engine RPM is increased, the back pressure caused by a clogged exhaust system causes the

needle to slowly drop to 0 kPa (0 in-Hg). The needle then may slowly rise. Excessive exhaust restriction causes the needle to drop to a low point even if the engine is only idling.

- Attach a vacuum gauge to the intake manifold vacuum source.
- Observe the vacuum gauge while increasing the engine RPM.

Does the vacuum gauge indicate an exhaust restriction concern?

Yes	No
REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. To continue diagnosis of a symptom (lack of power, loss of power, or no start), REFER to Section 3 Symptom Charts.	No indication of restrictions or leaks has been detected in the exhaust system. To continue diagnosis of a symptom (lack of power, loss of power, or no start), REFER to Section 3 Symptom Charts.

HF10 CARRY OUT THE CATALYST MONITOR DRIVE CYCLE

- Carry out the catalyst monitor drive cycle. Refer to Section 2, [On Board Diagnostic \(OBD\) Drive Cycle](#).
- Retrieve the continuous memory DTCs.

Are DTCs P0420 or P0430 present?

Yes	No
INSTALL a new catalyst between the monitored HO2S sensors, only for the bank referenced, (P0420 Bank 1), (P0430 Bank 2). Do not install a new unmonitored catalyst unless it is repaired as an assembly. REFER to the Workshop Manual Section 309-00, Exhaust System. CLEAR the DTCs. REPEAT the self-test.	The test is complete and no concerns are present.
