

HF: Catalyst Efficiency Monitor And Exhaust Systems

This pinpoint test is intended to diagnose the following:

- catalytic converter
- exhaust system

HF1 CHECK FOR DTCS

Are DTCs P0420 or P0430 present?

Yes	GO to HF2 .
No	For symptoms without DTCs, GO to HF6 . For all others, RETURN to Section 3, Symptom Charts for further direction.

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 noticed a high engine 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 PCM self-test.

Are any DTCs present other than DTCs P0420 or P0430?

Yes	GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions for pinpoint test direction and REPAIR the other DTCs first. Clear the PCM DTCs. REPEAT the self-test.
No	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 may be color coded to make sure the correct connection is made.

If the electrical connections of the rear HO2S are 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	REPAIR as necessary. Clear the PCM DTCs. CARRY OUT the catalyst monitor drive cycle to verify the repairs.
No	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 to fuel mixture. This rich air to fuel mixture can cause higher than normal catalyst operating temperatures.

- Ignition ON, engine OFF.
- For Aviator, Continental 2.0L, Continental 2.7L, Continental 3.0L, Corsair 2.0L, Corsair 2.3L, Edge, Escape/Kuga 1.5L, Escape/Kuga 2.0L, Explorer 2.3L, Explorer 3.0L, Flex 3.5L GTDI, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, MKZ, Mustang 2.3L, Nautilus, Ranger 2.3L, Transit Connect 1.0L and Transit Connect 2.0L.
- Access the PCM and monitor the FLP (PRESS) PID.
- For mechanical returnless fuel systems (MRFS),
- Ignition OFF.
- Relieve the fuel pressure. Refer to the Workshop Manual Section 310-00, Fuel System for the Fuel System Pressure Release procedure.
- Mechanical fuel pressure gauge connected.
- Ignition ON, engine OFF.
- Pressurize the fuel system. Refer to the Workshop Manual Section 310-00, Fuel System for the Fuel System Pressure Release procedure to pressurize the fuel system.
- Cycle the ignition several times to charge the fuel system.
- Compare the fuel pressure reading to the Fuel System Specification Chart found in Pinpoint Test HC. GO to Pinpoint Test [HC](#).
- Ignition OFF.

Is the fuel pressure within specifications?

Yes	GO to HF5 .
No	GO to Pinpoint Test HC .

HF5 CHECK FOR LEAKS IN THE EXHAUST SYSTEM

NOTICE: Pressure above 241 kPa (35 psi) can cause damage to system components. Regulate the shop air to 34.4 kPa (5 psi) before connecting to the system.

- Pressurize the exhaust system at the exhaust pipe outlet with 34.4 kPa (5 psi) regulated shop air.
- Check the exhaust system for leaks using a soap and water solution.
- Apply the soap and water solution to the following areas:
 - the exhaust flanges and gaskets
 - the universal HO2S and mounting surface
 - the exhaust system in between the universal HO2S and rear HO2S
 - the downstream HO2S and mounting surface
 - the exhaust system within 15.25 cm (6 inches) of the downstream HO2S and mounting surface
- Check the exhaust flange bolts for correct torque.
- Check the downstream HO2S for correct torque.

Is a concern present?

Yes	REPAIR as necessary. Clear the PCM DTCs. CARRY OUT the catalyst monitor drive cycle to verify the repairs.
No	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	REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	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	GO to HF8 .
No	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	REPAIR as necessary. Clear the PCM 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	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	REPAIR as necessary. Clear the PCM 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	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](#).
- Carry out the PCM self-test.

Are DTCs P0420 or P0430 present?

Yes	INSTALL a new catalyst between the monitored HO2S, 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 PCM DTCs. REPEAT the self-test.
No	The test is complete and no concerns are present.

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