DTC P0420 or P0430

Diagnostic Instructions

- Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.

DTC Descriptors

DTC P0420

Catalyst System Low Efficiency Bank 1

DTC P0430

Catalyst System Low Efficiency Bank 2

Circuit/System Description

Important: A new converter with less than 100 miles on it may set DTC P0420 or P0430 due to out-gassing of the internal matting. Operating the vehicle at highway speeds for approximately 1 hour may correct the condition.

A 3-way catalytic converter (TWC) controls emissions by converting hydrocarbons (HC) and carbon monoxide (CO) into carbon dioxide (CO_2), and oxides of nitrogen (NOx) into nitrogen. The TWC also stores oxygen. When the listed idle conditions follow the listed driving conditions the Catalyst System Efficiency test will run. The engine control module (ECM) monitors this oxygen storage capacity by comparing the pre and post-catalyst oxygen sensor signals while adding and subtracting fuel during specific idle conditions. The ECM compares the pre and post-catalyst oxygen sensor signals to determine if the oxygen storage capacity of the catalyst is degraded.

Conditions for Running the DTC

1. Driving Conditions
   - DTCs P0030, P0031, P0036, P0037, P0038, P0068, P0106, P0107, P0108, P0112, P0113, P0117, P0118, P0120, P0121, P0122, P0123, P0125, P0128, P0130, P0131, P0132, P0133, P0134, P0135, P0136, P0137, P0138, P0140, P0141, P0171, P0172, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0220, P0300, P0315, P0326, P0327, P0336, P0340, P0341, P0442, P0446, P0452, P0453, P0455, P0496, P0500 (manual transmission only), P0502, P0506, P0507, P0601, P0602, P0606, P0641, P0722, P0723, P1133, P1134, P1516, P1621, P2135, P2138, P2176 are not set.
   - The engine has been running for more than 10 minutes.
   - The vehicle has been driven at more than 1,000 RPM for more than 1 minute.
   - The vehicle is in Closed Loop.
   - The vehicle has Fuel Trim Learn enabled.
   - The engine coolant temperature (ECT) is between 70–125°C (156–257°F).

- The barometric pressure (BARO) is more than 70 kPa.
- The catalytic converter calculated temperature is greater than or equal to 450°C (842°F).
- The intake air temperature (IAT) is between −20 and +85°C (−4 and +185°F).
- The battery voltage is more than 11 volts.

2. Idle Conditions
   - The vehicle speed is less than 3.2 km/h (2 mph).
   - For automatic transmissions, the transmission is in Reverse, Drive, or Low.
   - The throttle position (TP) is 2 percent or less.
   - The short term fuel trim (FT) is between −10 and +10 percent.
   - This diagnostic attempts one test during each valid idle period when the above conditions have been met. This diagnostic attempts up to 6 tests during each drive cycle.

Conditions for Setting the DTC

- The ECM has determined the catalyst efficiency has degraded below a calibrated threshold.
- This diagnostic may conclude in one test attempt. However, this diagnostic may require as many as 18 test attempts, which would require at least 3 drive cycles. Each test attempt may conclude within approximately 1 minute.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame/Failure Records.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 4 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Reference Information

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Electrical Information Reference

Diagnostic Trouble Code (DTC) List - Vehicle

Circuit/System Verification

Notice: Refer to Three-Way Catalytic Converter Damage Notice.

Notice: Refer to Heated Oxygen Sensor Resistance Learn Reset Notice.

Important: A new converter with less than 100 miles on it may set DTC P0420 or P0430 due to out-gassing of the internal matting. Operating the vehicle at highway speeds for approximately 1 hour may correct the condition.

1. If any other DTCs are set perform those diagnostics first.
2. Inspect for the following conditions, which may cause a catalytic converter to degrade:
    - An engine misfire
    - High engine oil or high coolant consumption
    - Retarded spark timing
    - A weak or poor spark
    - A lean fuel mixture
    - A rich fuel mixture
    - A damaged oxygen sensor or wiring harness
    - The catalyst test may abort if the vehicle falls outside the conditions for running the DTC.
    - A catalyst may be temporarily degraded if a fuel with high sulfur content has been used. Drive the vehicle at highway speeds for 10 minutes and retest the converter.
3. Operate the vehicle within the Conditions for Running the DTC.

    ⇒ If the DTC fails this key cycle, continue with this procedure.
4. Inspect the catalytic converter for the following conditions:
    - Dents
    - A severe discoloration caused by excessive temperatures
    - Road damage
    - An internal rattle caused by damaged catalyst substrate
    - Restrictions

        ⇒ If a condition is found, replace the catalytic converter.
5. Inspect the exhaust system for the following conditions:
    - Leaks
    - Physical damage
    - Loose or missing hardware
    - Properly torqued HO2S
    - Restrictions

        ⇒ If a condition is found, repair the exhaust system.
6. Inspect the post catalyst HO2S for the following conditions:
    - A grounded wiring harness
    - Damage

        ⇒ If a condition is found, replace the post catalyst HO2S.

        ⇒ If no physical condition is detected, replace the catalytic converter.

Repair Instructions

Important: A new converter with less than 100 miles on it may set DTC P0420 or P0430 due to out-gassing of the internal matting. Operating the vehicle at highway speeds for approximately 1 hour may correct the condition.

- Exhaust Manifold Replacement - Left Side
- Exhaust Manifold Replacement - Right Side
- Heated Oxygen Sensor Replacement - Bank 1 Sensor 2
- Heated Oxygen Sensor Replacement - Bank 2 Sensor 2
- Exhaust Leakage
- Restricted Exhaust

Repair Verification

1. Clear the DTCs.
2. Allow the engine coolant temperature to reach 70°C (156°F).
    - Place the gear selector in Park, Neutral for manual.
    - Set the parking brake.
3. Press and hold the service brake.
4. Run the engine for 6 minutes at 2500 RPM.
5. Allow engine speed to return to idle speed, then place gear selector into Drive, or apply clutch pedal for manual.
6. After 2 minutes verify that DTC P0420 or P0430 have passed or failed this ignition cycle.

    ⇒ If not passed or failed this ignition cycle, the test aborted resulting in an inconclusive test result. The above test may need to be repeated up to 5 more times during this drive cycle. The first test should be run after the initial warm up period of 6 minutes. Between subsequent tests maintain 2,500 RPM for 2 minutes.
7. If 6 tests have been attempted and the DTC has not run or passed during this key cycle, turn the key to OFF for 30 seconds, then run the procedure a second time.