TECH NOTES: INSTALLATION

ATTENTION: Refer to the appropriate shop manual for your vehicle to obtain specific service procedures for this part. If you do not have a service manual or lack the skill to install this part, it is recommended that you seek the services of a qualified technician. Pay special attention to all cautions and warnings included in the shop manual. Read and follow all instructions carefully.

Various Makes and Models

Proper diagnostics are required before replacing a catalytic converter. Replacing the catalytic converter without fixing the cause of the failure may lead to another ruined converter that may not be covered under manufacturer's warranties.

A proper break-in period is required for a correct installation:

A replacement catalytic converter needs to undergo a proper "break-in" procedure to ensure that it will continue to work the way it is supposed to and deliver the required emissions reliability and long service life. If the converter is not warmed-up properly (broken-in), the substrate inside could be adversely affected and eventually cause the converter to fail down the road.

Here are suggested steps for a proper break-in or warm-up:

- Start engine but do not touch the accelerator pedal.
- Idle the engine and allow it to warm up slowly.
- After 5 minutes, increase the engine speed to 2500 RPM.
- Hold at 2500 RPM for 2 minutes.
- Allow engine to cool down.
- Road test vehicle to confirm correct installation.

Installation suggestions:

- Silicone-based products or Teflon sealants should not be used on any part of the exhaust system. They are not designed to operate at high exhaust temperatures and will out gas, causing damage to O2 sensors.
- When a converter is replaced, the technician will need to perform a drive cycle in order to correctly reset the ECM. Follow the manufacturer guidelines for the correct drive cycle.

Disclaimer:
Even though every attempt is made to ensure this information is complete and accurate, it is impossible to account for all possible circumstances or situations. Please consult with a qualified auto technician before attempting to perform any work you are not qualified to do. Automobiles can be hazardous to work on; be sure to take all necessary safety precautions. Failure to do so may result in property damage or personal injury. Certain motor vehicle standards and performance requirements may apply to your motor vehicle (such as Federal Motor Vehicle Safety Standards by the National Highway Traffic Safety Administration). Be sure that your work is performed in accordance with such standards and that you do not disable any motor vehicle safety feature.

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Various Makes and Models

P0420/P0430 DTC Troubleshooting Guide

1.) Check if the P0420/P0430 is the only code present. If not, diagnose all other codes. The converter is the end result in an OBD-II diagnostic. If there is a problem with one of the sensors in the engine or exhaust, it can affect the amount of fuel entering the engine.

- a. Lean condition, too little fuel
  - i. Raises combustion temperatures and exhaust temperatures
  - ii. Extreme temperatures lower the efficiency of the catalyst and can trigger P0420/P0430 DTC
  - iii. Temperatures above 2,100 degrees F result in melted catalysts
  - iv. Normal operating temperatures for catalysts range between 900 to 1,400 degrees F
- b. Rich condition, too much fuel
  - i. Excess fuel can reach the converter, coating the catalyst
  - ii. Cools as well as protects the precious metals in catalyst from reacting normally
  - iii. Potential for spark entering converter, igniting fuel, cause secondary combustion, destroys catalyst

2.) If the P0420/P0430 code is the only one present, clear the codes and start the engine. Warm the engine until the water temperature is stable. Then increase engine speed for about three minutes, usually between 2,500 and 3,000 rpm.

- a. Check the O2 sensor waveforms between the front and rear O2 sensors
  - i. If the front O2 wave form is switching from high to low (rich to lean) and the rear is close to a straight line, the original converter should be OK.
  - ii. If the rear O2 sensor is mimicking the front one, the converter most likely took damage and may need to be replaced.

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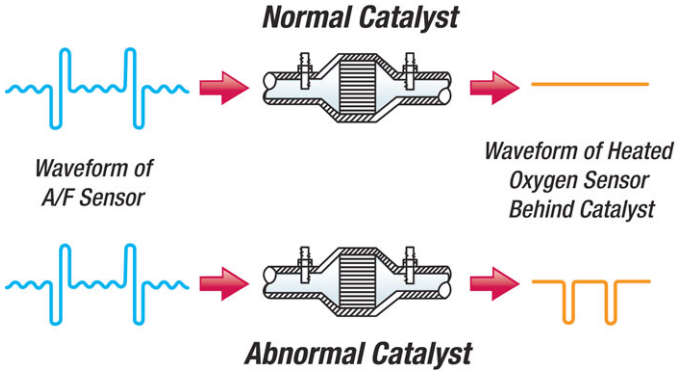
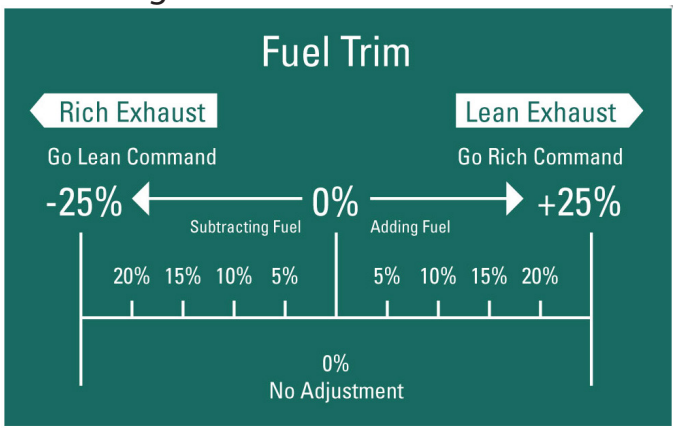


** A drive cycle may need to be completed and the converter monitor ready before you know whether the converter is good or bad. Follow the manufacturer guidelines for the correct drive cycle.*

3.) Check the freeze-frame data. Specifically the vehicle speed, engine speed, O2 readings and fuel trim from when the DTC was set.

4.) Check the fuel trim. Consult a repair database for proper fuel trim percentages for your vehicle, as they can vary.

- a. When the fuel trim is high the engine is getting extra unmetered air into the intake and the ECM is compensating by adding extra fuel into the intake.
  - i. Recommendation to look for any type of vacuum leak, intake leak or dirty mass-air-flow (MAF) sensors.
- b. When the fuel trim is low the engine is getting extra unmetered fuel into the intake and the ECM is compensating by leaning out the fuel mixture.
  - i. Recommendation to check for stuck fuel injectors or bad fuel-pressure regulators.



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** Once the problem has been identified the repairs should be made, and after the warm-up process has been performed the vehicle should be tested to ensure that no other codes arise.*

5.) If the fuel trim is within the recommended range, check the O2 values.

a. The front O2 sensor should be switching from rich (over 600mV) to lean (under 300mV) and the rear O2 sensor, or converter monitor, should be a nice, smooth line with minimal variance in mV.

b. Make sure that neither the front nor rear sensor switching rates drop out or spike for extended amounts of time.

c. If either a slow switching rate or spike/drop-out happens, but the O2 then recovers and appears to be operating normally, the O2 sensor may be starting to deteriorate.

i. If the O2 sensor is determined to have failed, remove it and check for ant type of contamination (usually be oil or antifreeze).

ii. If the catalyst is contaminated the converter will need to be replaced, but not until after the engine is repaired and the contaminating agent is no longer entering the exhaust.

d. If none of the above conditions are present and the engine is at operating temperature look at the front and rear O2 sensors. If the rear O2 sensor is mimicking the front one, the converter will most likely need to be replaced.

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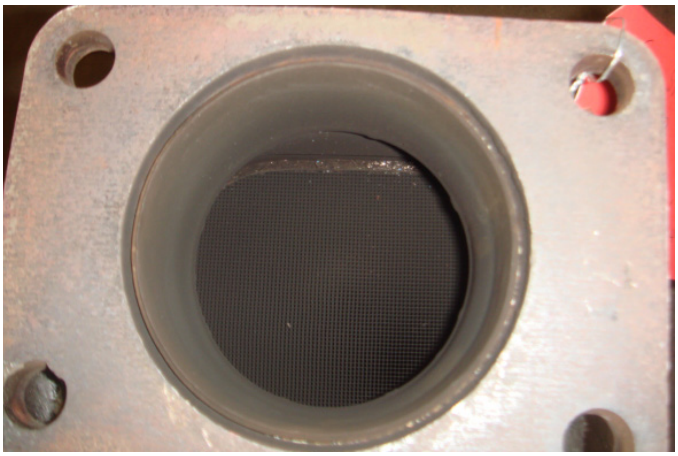
6.) Check for external damage to the converter.

7.) Check for discoloration of the existing catalyst that was present on the vehicle at the time of the DTC was created.

Normal converter coloration indicating proper combustion



Carbon/soot contaminated converter

8.) Test the installed converter itself.

- a. Vacuum test
  - i. Connect a vacuum gauge to the vacuum on the intake manifold, carburetor, or throttle body. Note the reading at idle.
  - ii. Raise and hold engine speed at 3,000 RPM. The needle will drop when you first open the throttle, but should then rise and level off.
  - iii. If the vacuum reading starts to drop, pressure may be backing up in the exhaust system indicating a blockage somewhere in the exhaust system.
- b. Backpressure test
  - i. Measure backpressure directly. If vehicle's engine has air injection, disconnect the check valve from the distribution manifold and connect a low pressure gauge. Or, remove the oxygen sensor and take your reading at its port in the manifold or head pipe.
  - ii. A reading of more than 1.25 PSI at idle or more than 3 PSI at 2,000 RPM tells you there's an exhaust restriction.