P0433: HEATED CATALYST EFFICIENCY BELOW THRESHOLD (BANK 2)

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Advanced
Repair Cost	:	**$900-$2500**
Can I Still Drive?	:	**Yes**

What Does The P0433 Code Mean?

If your OBD-II equipped vehicle has stored a code P0433, it means that the powertrain control module (PCM) has detected a problem with the efficiency of the catalytic converter for engine bank two. Bank 2 indicates that the malfunction has occurred in the bank of the engine which does not contain the #1 cylinder.

The catalytic converter is used to reduce exhaust emissions produced by diesel and gasoline fueled engines. Its key component is a filtration block, composed of ceramic fibers interwoven with platinum and other precious metals, enclosed in an inline steel housing and positioned in the exhaust system.

Nitrogen oxide (N2O) particles, carbon monoxide, and unburned hydrocarbons are reduced to harmless ions of nitrogen, oxygen, carbon dioxide, and water inside the catalytic converter.

Emission reduction is accomplished using the dense filtration block combined with the extreme heat of the engine exhaust. Temperatures inside the catalytic converter must reach at least 800-degrees Fahrenheit to reduce emission levels effectively. Upstream and downstream oxygen (O2) sensor signals are used by the PCM to monitor catalytic converter efficiency.

Exhaust gases are pushed through the manifold, into the exhaust pipe, over the upstream O2 sensor, and through the catalytic converter. After they pass through the catalytic converter, they

flow across the downstream O2 sensor.

If the upstream and downstream O2 sensor signals reflect too similar an exhaust oxygen concentration, a code P0433 will be stored and a malfunction indicator lamp (MIL) may be illuminated.

Other bank 2 catalyst efficiency trouble codes include P0430, P0431, P0432, P0434, P0435, P0436, P0437, P0438, and P0439.

What Are The Symptoms Of The P0433 Code?

A stored code P0433 could indicate that the fuel delivery system is not functioning properly. It should be treated as severe.

Symptoms of this code may include:

- Decreased fuel efficiency
- A lack of general engine performance
- Other related diagnostic trouble codes
- MIL (malfunction indicator lamp) illumination

What Are The Potential Causes Of The P0433 Code?

Potential causes for this code to set are:

- Bad catalytic converter
- Ignition misfire/s
- A faulty mass air flow or manifold air pressure sensor
- Defective O2 sensor/s
- Burnt, broken, or disconnected wiring and/or connectors
- Pre-cat engine exhaust leak

How Can You Fix The P0433 Code?

A diagnostic scanner, digital volt ohmmeter (DVOM), and a reliable vehicle information source (such as All Data DIY) will be required for me to diagnose a code P0433.

Any misfire codes, throttle position sensor codes, manifold air pressure codes, or mass air flow sensor codes should be addressed before attempting to diagnose a stored code P0433. The engine must also be running efficiently before diagnosing a P0433.

I would usually begin with a visual inspection of system wiring harnesses and connectors. I would focus on harnesses that are routed near hot exhaust pipes and manifolds, as well as those that are routed near sharp edged objects like exhaust shields.

I would continue by connecting the scanner to the vehicle diagnostic port and retrieving all trouble codes and freeze frame data. I like to write this information down as it may be helpful if this proves to be an intermittent code. Intermittent codes can be much harder to diagnose.

Next, I'd clear the codes and test-drive the vehicle.

Should the P0433 be immediately reset, I would start the engine and allow it to reach normal operating temperature. I would let it idle (with the transmission in neutral or park) and use the scanner data stream to observe O2 sensor input data. Narrowing the data stream to include only pertinent data will yield a more accurate data sample.

If the engine is functioning efficiently, the upstream O2 sensor will cycle regularly from one-millivolt (.100-volts) to nine-millivolts (.900-volts) and downstream O2 sensor data should reach a mid-line and settle there, after the PCM enters closed loop operation. If upstream and downstream O2 sensor signals are too similar, after the PCM has reached closed loop operation, suspect a defective catalytic converter.

Consult your vehicle information source for recommended vehicle specifications and use the DVOM to check resistance of the O2 sensor in question. Disconnect all related controller electrical connectors before attempting to test system circuit resistance with the DVOM.

Additional diagnostic notes:

- The presence of a stored P0433 does not automatically condemn the catalytic converter
- O2 sensor failure is more common than catalytic converter failure
- Remanufactured catalytic converters are much less reliable than new replacement converters

Severity Description

A stored code P0433 could indicate that the fuel delivery system is not functioning properly. It should be treated as severe.

Reference Sources

P0433 Heated Catalyst Efficiency Below Threshold (Bank 2), OBD-Codes.