

GENERIC · POWERTRAIN

P0424

OBD-II TROUBLE CODE

P0424

Heated Catalyst Temperature Below Threshold (Bank 1)

P0424 means the powertrain control module (PCM) has determined that the heated catalyst on bank 1 is not reaching the temperature threshold expected for proper emissions reduction. The PCM monitors the catalyst temperature indirectly through oxygen sensor signals and, on some systems, a dedicated catalyst temperature sensor, and it sets this code when the calculated or measured temperature stays below the calibrated minimum during a monitored drive cycle.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- A slight decrease in fuel economy as the PCM may enrich the mixture to try to raise catalyst temperature
- Failed emissions inspection due to the catalyst monitor not completing or reporting not ready
- In rare cases, a sulfur or rotten egg odor from the exhaust if the catalyst is not lighting off properly
- Occasional rough running or hesitation if the underlying cause also affects air-fuel ratio control

Common causes, most likely first

- 1 Faulty heated oxygen sensor (HO2S) or catalyst temperature sensor giving inaccurate readings to the PCM
- 2 Open or shorted wiring or connector corrosion in the catalyst heater circuit or sensor circuit
- 3 Failed catalyst heater element or relay, preventing the catalyst from reaching operating temperature
- 4 Exhaust leak before or near the catalyst, allowing oxygen to skew temperature calculations
- 5 Aging or contaminated catalytic converter that no longer retains heat or converts efficiently
- 6 Engine misfire or rich running condition that overloads the catalyst and keeps it from reaching threshold
- 7 Low coolant level or a stuck-open thermostat causing the engine to run cooler than normal, indirectly affecting catalyst temperature



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data to see the conditions when the code set, then check for related codes in the powertrain and body systems
- 2 Inspect the catalyst heater circuit wiring and connectors for damage, corrosion, or loose pins, and verify power and ground at the heater element
- 3 Test the heated oxygen sensor and catalyst temperature sensor response with a scan tool or oscilloscope to confirm they are reporting accurately
- 4 Perform a visual inspection of the exhaust system for leaks, loose clamps, or damaged gaskets that could affect catalyst temperature
- 5 Check engine coolant temperature and thermostat operation to rule out a cold-running engine that prevents the catalyst from reaching threshold
- 6 If the heater circuit and sensors test good, perform a catalyst efficiency test or temperature rise test to determine if the converter itself is failing
- 7 Replace the faulty component, clear the codes, and complete a drive cycle to verify the catalyst monitor runs and passes

What the catalyst temperature code hides

- A P0424 is often set by a lazy upstream oxygen sensor rather than a failed catalyst, because the PCM calculates catalyst temperature from oxygen sensor switching activity and a slow sensor skews that calculation.
- Many technicians replace the catalytic converter only to have the code return because a small exhaust leak upstream of the catalyst lets in fresh air and cools the converter below threshold.
- On some vehicles, the catalyst heater is controlled by a relay that fails intermittently, so the code may set only on cold starts and clear after a few drive cycles, making it easy to misdiagnose as a sensor problem.
- A stuck-open thermostat can keep the engine coolant below normal operating temperature, which reduces exhaust heat and prevents the catalyst from reaching its light-off temperature, setting P0424 without any catalyst fault at all.
- The code does not always mean the catalyst is bad; it can be set by a contaminated sensor or a wiring issue that causes the PCM to see a lower temperature than actual, so always verify sensor readings before condemning the converter.

Can I keep driving with P0424?

You can usually continue driving with P0424 because the vehicle remains driveable, but avoid heavy loads and prolonged idling until the fault is repaired. Have the system diagnosed soon, since continued driving with a cold catalyst can lead to increased emissions and may eventually damage the converter.



Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Digital multimeter for circuit and sensor testing
- Infrared thermometer for checking catalyst temperature rise
- Oscilloscope for observing oxygen sensor waveforms
- Basic hand tools for inspecting wiring and exhaust components

Reading P0424

P	Powertrain: engine, transmission and emissions.
0	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
4	Auxiliary emission controls.
24	The exact fault within that area.

Often seen with

P0130 O2 Sensor Circuit Malfunction (Bank 1 Sensor 1) · **P0135** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 1) · **P0420** Catalyst System Efficiency Below Threshold (Bank 1) · **P0421** Warm Up Catalyst Efficiency Below Threshold (Bank 1) · **P0430** Catalyst System Efficiency Below Threshold (Bank 2)

See it working

Watch the animated explainer [How a Wideband Air-Fuel Sensor Works](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0424/>

