

GENERIC · POWERTRAIN

P0052

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0052

HO2S Heater Control Circuit High (Bank 2 Sensor 1)

P0052 means the powertrain control module (PCM) has detected an abnormally high voltage on the heater control circuit for the upstream oxygen sensor on bank 2, which is the side of the engine that does not contain cylinder number one. The heater is a resistive element inside the sensor that warms it quickly for accurate fuel control, and a high-voltage reading tells the PCM that the circuit is likely open, shorted to voltage, or has excessive resistance.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Low

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering and 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 because the sensor takes longer to reach operating temperature.
- Occasional rough idle or hesitation when the engine is cold, clearing as it warms up.
- A pending or stored P0052 code that returns after clearing if the fault is constant.
- In rare cases, a failed emissions test due to the oxygen sensor heater not functioning.
- No driveability complaints at all when the fault is intermittent or only affects the heater circuit.

Common causes, most likely first

- 1 Open heater element inside the bank 2 sensor 1 oxygen sensor, which is the most common cause.
- 2 Damaged or corroded wiring harness between the sensor and the PCM, including chafed insulation or broken strands.
- 3 Loose, corroded, or disconnected electrical connector at the oxygen sensor or at the PCM.
- 4 High resistance in the heater ground circuit, often due to a poor chassis ground connection.
- 5 A short to voltage on the heater control wire, which can be caused by contact with another powered circuit.
- 6 A faulty PCM driver for the heater circuit, though this is less common than sensor or wiring failures.



How to diagnose and fix it

- 1 Clear the code and test-drive the vehicle to see if P0052 returns, confirming whether the fault is hard or intermittent.
- 2 Inspect the oxygen sensor connector and wiring for corrosion, loose pins, or physical damage, and repair as needed.
- 3 Measure the resistance of the heater element at the sensor connector and compare it to the manufacturer's specification; replace the sensor if it is open or out of range.
- 4 Check for voltage on the heater control wire with the key on and engine off, looking for an unexpected short to power.
- 5 Perform a voltage drop test on the heater ground circuit to rule out excessive resistance in the ground path.
- 6 If wiring and sensor test good, back-probe the PCM connector to verify the control signal and check for a faulty PCM driver.
- 7 After repairs, clear codes and complete a drive cycle to confirm the heater circuit operates correctly and the code does not reset.

Why the heater circuit fails without warning

- A P0052 can be set by a heater circuit that is open only when the engine is cold, so testing the sensor resistance when the engine is at operating temperature may miss the fault.
- Many technicians replace the oxygen sensor first, but a corroded ground connection at the chassis can mimic a failed heater and cause the new sensor to set the same code.
- The heater element inside the sensor can fail intermittently, so a resistance check that passes does not guarantee the sensor is good; a wiggle test while monitoring heater current can reveal the problem.
- This code does not always mean the sensor is bad; a short to voltage on the control wire from a nearby circuit, such as a fuel injector or ignition coil, can set P0052 without any sensor fault.
- On some vehicles, the PCM uses the heater circuit to monitor sensor readiness, so a P0052 may prevent other oxygen sensor monitors from running and delay diagnosis of unrelated faults.

Can I keep driving with P0052?

You can generally continue driving with P0052 because the engine will still run, but the oxygen sensor may take longer to warm up, which can slightly increase emissions and fuel consumption. Avoid long periods of idling and schedule a diagnosis soon, especially if you need to pass an emissions inspection.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Back-probe kit or piercing probes
- Wiring diagram for the specific vehicle
- Heat gun or hair dryer for cold-start testing



Reading P0052

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 0** Fuel and air metering and auxiliary emission controls.
- 52** The exact fault within that area.

Often seen with

P0030 HO2S Heater Control Circuit (Bank 1 Sensor 1) · **P0031** HO2S Heater Control Circuit Low (Bank 1 Sensor 1) · **P0032** HO2S Heater Control Circuit High (Bank 1 Sensor 1) · **P0050** HO2S Heater Control Circuit (Bank 2 Sensor 1) · **P0051** HO2S Heater Control Circuit Low (Bank 2 Sensor 1)

See it working

Watch the animated explainer [How a Gyroscope Works: Gimbals and Precession](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0052/>

