

VOLKSWAGEN · POWERTRAIN

P1116

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1116 · Volkswagen

Oxygen Sensor Heater Circuit Open Bank 1 Sensor 1

P1116 on Volkswagen vehicles means the engine control module (ECM) has detected an open circuit in the heater element of the upstream oxygen sensor on bank 1, sensor 1. The ECM commands the heater on to bring the sensor to operating temperature quickly, but the circuit shows no current flow, indicating a broken wire, failed heater element, or poor connection.

SYSTEM

Powertrain

CODE TYPE

Volkswagen specific

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms.
- Slightly rough idle or hesitation when the engine is cold, because the sensor takes longer to become active.
- Increased fuel consumption during warm-up and short trips.
- Possible failed emissions test due to the sensor not reaching closed-loop operation quickly.
- In rare cases, a stored pending code or limp mode if the fault is intermittent and affects fuel trim.

Common causes, most likely first

- 1 Failed oxygen sensor heater element (open circuit inside the sensor).
- 2 Broken or chafed wire in the sensor heater circuit, often near the exhaust manifold or connector.
- 3 Corroded or loose electrical connector at the oxygen sensor or at the ECM.
- 4 Blown fuse that supplies power to the oxygen sensor heater circuit.
- 5 Open circuit in the heater ground circuit, including a bad ground connection.
- 6 Damage to the wiring harness from heat, vibration, or rodent activity.
- 7 Rarely, a faulty ECM driver for the heater circuit.



How to diagnose and fix it

- 1 Check the fuse that protects the oxygen sensor heater circuit and replace it if blown.
- 2 Inspect the oxygen sensor connector and wiring for corrosion, damage, or loose pins; clean or repair as needed.
- 3 Measure the resistance of the oxygen sensor heater element with a multimeter and compare to specification; replace the sensor if open.
- 4 Check for battery voltage at the heater supply wire with the key on and engine off; repair the circuit if voltage is missing.
- 5 Check continuity of the heater ground circuit from the sensor connector to a known good ground; repair any open.
- 6 If the circuit checks out, verify the ECM is commanding the heater on and check for an open in the control wire between the ECM and sensor.
- 7 Clear the code and perform a road test to confirm the repair; monitor oxygen sensor heater status with a scan tool.

What a P1116 heater circuit open really means

- A P1116 can be set by a heater circuit that is open only when cold, so the sensor may test fine at room temperature but fail when the engine bay heats up.
- Volkswagen oxygen sensor heaters are powered through a fuse that often also supplies other components, so a blown fuse may cause additional codes that seem unrelated.
- The ECM may not set a heater code immediately; it often requires two consecutive trips with the fault present, so an intermittent open can be missed during a quick scan.
- Replacing the oxygen sensor without checking the wiring harness is a common misdiagnosis, especially if the old sensor's heater still shows continuity.
- On some Volkswagen engines, the heater circuit shares a ground with other sensors, so a bad ground can cause multiple sensor codes including P1116.

Can I keep driving with P1116?

You can usually drive the vehicle with P1116, but the oxygen sensor will take longer to become active, which can increase fuel consumption and emissions during warm-up. Avoid long periods of idling or short trips until the fault is repaired, and address it promptly to prevent catalytic converter damage from a rich-running engine.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific Volkswagen model
- Socket set and oxygen sensor wrench
- Contact cleaner and dielectric grease



Reading P1116

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (Volkswagen): its meaning depends on the make.
- 1** Fuel and air metering.
- 16** The exact fault within that area.

Often seen with

P1117 Oxygen Sensor Heater Circuit Short To Ground Bank 1 Sensor 2 · **P1115** Oxygen Sensor Heater Circuit Short To Ground Bank 1 Sensor 1 · **P1115** Engine Torque Control Cut Signal Circuit High Input · **P1117** ECT Sensor Signal Intermittent · **P1115** HO2S12 Heater Circuit Low Voltage · **P1117** HO2S12 Heater Circuit Low Voltage · **P1115** Engine Coolant Temperature Sensor Intermittent · **P1117** Engine Coolant Temperature Below Minimum Voltage · **P1115** Intake Air Temperature B (IAT2) Circuit High Input · **P1117** Engine Coolant Temperature Sensor Intermittent · **P1115** Engine Coolant Temperature (ECT) Sensor Circuit Intermittent · **P1117** Engine Coolant Temp Signal Out-Of-Range Low · **P1115** Coolant Temperature Sensor Plausibility · **P1117** Mass Or Volume Air Flow Circuit Low Input Bank 2 · **P0130** O2 Sensor Circuit Malfunction (Bank 1 Sensor 1) · **P0141** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 2) · **P0135** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 1)

See it working

Watch the animated explainer [How a Supercharger Works: Roots Blower in X-Ray](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/volkswagen-p1116/>

