

VOLKSWAGEN · POWERTRAIN

P1117

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1117 · Volkswagen

Oxygen Sensor Heater Circuit Short To Ground Bank 1 Sensor 2

P1117 on Volkswagen vehicles means the engine control module (ECM) has detected a short to ground in the heater circuit of the downstream oxygen sensor on bank 1, which is sensor 2 after the catalytic converter. The ECM monitors the heater element's current draw and flags this code when the circuit stays grounded longer than expected, preventing the sensor from reaching operating temperature.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Volkswagen specific	Medium	Intermediate	Fuel and air metering

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Slightly higher fuel consumption because the downstream sensor stays cold and the ECM defaults to a richer mixture
- Occasional rough idle or hesitation during cold starts while the engine runs in open-loop mode
- Failed emissions test due to the sensor not being ready or the catalytic converter monitor not completing
- In rare cases, a blown fuse for the oxygen sensor heater circuit that also affects other engine management components

Common causes, most likely first

- 1 Damaged or chafed heater wire between the ECM and the downstream oxygen sensor shorting to the chassis
- 2 Failed downstream oxygen sensor with an internally shorted heater element
- 3 Corroded or water-intruded connector at the sensor or along the harness, allowing the heater pin to contact ground
- 4 Blown fuse or relay supplying the oxygen sensor heater circuit, often caused by the short itself
- 5 Faulty ECM driver for the heater circuit, though this is rare compared with wiring and sensor faults
- 6 Aftermarket sensor with incorrect internal resistance or pinout that mimics a short to ground



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data to confirm P1117 is active and not a stored history code from a previous repair
- 2 Inspect the downstream oxygen sensor harness and connector for chafing, corrosion, or contact with the exhaust or chassis, repairing any damage found
- 3 Measure resistance across the sensor heater pins and compare with the manufacturer's specification to rule out an internally shorted sensor
- 4 Check the heater circuit fuse and relay, replacing any blown fuse only after locating the short that caused it
- 5 Disconnect the sensor and ECM connectors, then measure resistance from the heater control wire to ground to isolate whether the short is in the harness or the ECM
- 6 Replace the downstream oxygen sensor if the heater element is out of specification or the connector is damaged beyond repair
- 7 Clear the code, perform a road test with the appropriate readiness monitors, and verify the heater circuit current returns to normal

What a shorted heater circuit really means

- A short to ground in the heater circuit often blows the same fuse that feeds the secondary air pump or other emissions components, so a blown fuse can be the first clue rather than a failed sensor.
- Technicians sometimes replace the downstream sensor only to have P1117 return because the real fault is a chafed wire where the harness passes near the exhaust heat shield or a sharp bracket.
- The ECM may set P1117 intermittently when water enters the sensor connector after a car wash or heavy rain, leaving no visible damage once the connector dries out.
- A heater circuit that is shorted to ground can still allow the sensor signal to read correctly, so live data may look normal even though the heater is not functioning.
- Volkswagen models with the sensor heater controlled by a low-side driver can set P1117 if the driver inside the ECM fails, but this should only be suspected after the harness and sensor have been ruled out.

Can I keep driving with P1117?

You can usually drive the vehicle short distances to a repair shop, but avoid long trips and heavy load because the cold downstream sensor keeps the engine in a less efficient calibration and can damage the catalytic converter over time. If the check engine light flashes or the engine runs poorly, stop driving and have the fault diagnosed immediately.



Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Digital multimeter with resistance and continuity functions
- Wiring diagram for the specific Volkswagen model and engine
- Socket set and oxygen sensor wrench
- Electrical contact cleaner and dielectric grease

Reading P1117

P Powertrain: engine, transmission and emissions.

1 Manufacturer-specific code (Volkswagen): its meaning depends on the make.

1 Fuel and air metering.

17 The exact fault within that area.

Often seen with

P1118 Oxygen Sensor Heater Circuit Open Bank 1 Sensor 2 · **P1118** Engine Coolant Temperature Above Maximum Voltage · **P1118** Manifold Absolute Temperature Circuit Low Input · **P1118** Engine Coolant Temp Signal Out-Of Range High · **P1118** Mass Or Volume Air Flow Circuit High Input Bank 2 · **P0135** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 1) · **P0136** O2 Sensor Circuit Malfunction (Bank 1 Sensor 2) · **P0141** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 2) · **P0420** Catalyst System Efficiency Below Threshold (Bank 1)

See it working

Watch the animated explainer [Engine Cooling System Trainer: How Engines Stay Cool](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/volkswagen-p1117/>

