

MAZDA · POWERTRAIN

P1127

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1127 · Mazda

HO2S Bank 1 Sensor 2 Heater Not On During Key On Engine Running Self Test

P1127 on Mazda vehicles means the powertrain control module (PCM) commanded the heater inside the downstream oxygen sensor (HO2S Bank 1 Sensor 2) to turn on during the Key On Engine Running (KOER) self-test, but the heater circuit did not respond as expected. The PCM monitors heater current or voltage and sets this code when it sees no heater activation during that specific test window.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Mazda specific	Low	Intermediate	Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Slightly higher fuel consumption because the downstream sensor stays cold longer than normal
- A pending or stored P1127 that returns immediately after clearing if the heater circuit is truly faulty
- In rare cases, a rough idle or hesitation during the first few minutes after a cold start
- No driveability complaint at all in many cases because the downstream sensor mainly monitors catalyst efficiency

Common causes, most likely first

- 1 Open or damaged heater element inside the Bank 1 Sensor 2 oxygen sensor
- 2 Broken, corroded, or chafed wiring in the sensor heater circuit between the PCM and the sensor
- 3 Blown fuse or faulty relay that supplies power to the oxygen sensor heater circuit
- 4 Poor ground connection at the sensor body or engine block ground strap
- 5 PCM internal driver fault for the heater control circuit (less common but possible)
- 6 Aftermarket or incorrect oxygen sensor installed that does not meet Mazda heater specifications



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data to confirm P1127 is the only heater-related code present
- 2 Inspect the oxygen sensor heater fuse and relay, then test for battery voltage at the heater supply wire with the key on
- 3 Measure resistance across the heater element at the sensor connector and compare to Mazda specifications for that engine
- 4 Check continuity and voltage drop on the heater ground and control wires from the PCM to the sensor connector
- 5 If the circuit checks out, command the heater on with a scan tool and watch heater current or voltage on live data
- 6 Replace the Bank 1 Sensor 2 oxygen sensor if the heater element is open or out of specification, using an OEM-quality part
- 7 Clear codes and run the KOER self-test to verify the heater activates and P1127 does not return

Why the downstream heater test fails on Mazdas

- A P1127 can set even when the downstream sensor still produces a plausible voltage signal, because the PCM is testing the heater circuit specifically and not the sensor's air-fuel reading.
- Technicians often replace the sensor first without checking the heater fuse and relay, which are shared with other circuits on many Mazda models and can cause a repeat code.
- Chafed wiring near the exhaust heat shield or at the connector pigtail is a common hidden cause that a simple resistance check at the sensor will not reveal.
- The KOER self-test only runs under specific conditions, so a heater that works intermittently may pass a static resistance test but still set P1127 during the test.
- An incorrect universal sensor with the wrong heater resistance can trigger P1127 even though it fits the connector and threads.

Can I keep driving with P1127?

You can usually keep driving with P1127 because the downstream sensor heater mainly affects emissions monitoring and cold-start sensor readiness, but avoid ignoring it long-term since a cold sensor can mask catalyst problems. Have the circuit checked soon, especially if the check engine light is accompanied by poor fuel economy or a pending catalyst code.

Tools that help

- OBD-II scan tool with live data and bidirectional heater control
- Digital multimeter with resistance and voltage drop functions
- Wiring diagram for the specific Mazda model and engine
- Fuse puller and test light
- Oxygen sensor socket and ratchet



Reading P1127

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

Often seen with

P1128 Long Term Fuel Trim Bank 1 System Too Lean · **P1128** Throttle Control Motor Lock · **P1128** MAP Lower Than Expected · **P1128** HO2S Bank 1 Sensor 1 Signals Swapped In Key On Engine Runnin · **P1128** Long Term Fuel Trim Multiplicative Air System High · **P1128** MAP Lower Than Expected · **P1128** Upstream Heated Oxygen Sensor Signals Reversed · **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 [How Push-Button Start Works: Keyless Ignition](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/mazda-p1127/>

