



P1150 · Mazda

HO2S Bank 2 Sensor 1 Not Switching Fuel Control Limit Reached

P1150 on a Mazda means the powertrain control module (PCM) has detected that the upstream heated oxygen sensor (HO2S) on bank 2 is not switching its voltage signal as expected, and the fuel control correction has reached its limit. The sensor is either stuck rich or stuck lean, so the computer can no longer adjust fuel delivery enough to bring the mixture back to stoichiometric.

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

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- A slight drop in fuel economy as the PCM defaults to a richer or less optimal fuel strategy
- Rough idle or hesitation during acceleration if the sensor is stuck lean
- Black sooty exhaust and a strong fuel smell if the sensor is stuck rich
- Occasional engine surging or poor throttle response when the PCM struggles to correct the mixture
- Failed emissions inspection due to high hydrocarbon or carbon monoxide readings

Common causes, most likely first

- 1 Failed or contaminated bank 2 upstream heated oxygen sensor (HO2S)
- 2 Exhaust leak before the sensor, such as a cracked manifold or blown gasket, allowing false air into the exhaust stream
- 3 Wiring damage or corroded connector at the bank 2 sensor 1 circuit, including open or shorted signal wires
- 4 Low fuel pressure or a restricted fuel filter causing a lean condition that the sensor cannot correct
- 5 Leaking fuel injector on bank 2 causing an excessively rich mixture that the sensor reports as stuck rich
- 6 Vacuum leak on the bank 2 side of the intake manifold, often from a cracked hose or intake gasket
- 7 PCM software calibration issue or a rare internal PCM driver fault for the oxygen sensor heater circuit



How to diagnose and fix it

- 1 Connect a scan tool and record freeze-frame data and oxygen sensor voltage readings for bank 2 sensor 1 to confirm the sensor is not switching.
- 2 Perform a visual inspection of the bank 2 upstream oxygen sensor, its wiring, and connector for damage, corrosion, or oil contamination.
- 3 Check for exhaust leaks before the sensor using a smoke machine or by listening for ticking noises during a cold start.
- 4 Measure fuel pressure and compare it to the Mazda specification for the engine, and inspect the fuel filter for restriction.
- 5 Use a propane enrichment tool or carburetor cleaner to check for vacuum leaks on the bank 2 side of the intake manifold.
- 6 Test the oxygen sensor heater circuit resistance and the signal wire continuity back to the PCM; replace the sensor if it fails the switching test.
- 7 If all external causes are ruled out, reprogram the PCM with the latest Mazda calibration or replace it only after confirming a driver fault.

Why bank 2 sensor 1 misleads many Mazda owners

- A P1150 code often appears after a bank 2 upstream oxygen sensor has been replaced with a generic or universal sensor that does not match Mazda's switching characteristics, causing the PCM to set the code again.
- Exhaust leaks upstream of the sensor are a common cause that many technicians miss because the leak can be small and only affect the sensor at idle or light load, not during a visual inspection.
- The code does not always mean the sensor is bad; a stuck-rich or stuck-lean fuel condition from a leaking injector or low fuel pressure can force the fuel control limit without any sensor fault.
- On some Mazda engines, a dirty mass airflow sensor (MAF) can skew fuel trims enough to set P1150 on bank 2 even though the oxygen sensor itself is healthy.
- A P1150 can be stored intermittently by a loose oxygen sensor connector that only loses contact during engine vibration, so always wiggle-test the harness while watching live data.

Can I keep driving with P1150?

You can usually drive the car short distances to a repair shop, but avoid heavy acceleration, towing, or long highway trips because the incorrect fuel mixture can overheat the catalytic converter and increase emissions. If the engine runs rough or the check engine light flashes, stop driving and have the vehicle towed.



Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Digital multimeter for checking sensor resistance and wiring continuity
- Fuel pressure gauge
- Smoke machine for exhaust and vacuum leak detection
- Propane enrichment tool or carburetor cleaner for vacuum leak testing
- Oxygen sensor socket and ratchet set

Reading P1150

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

Often seen with

P1151 Bank 1 Long Term Fuel Trim Range 1 Lower Lean Limit Exceeded · **P1151** Rear Oxygen Sensor Heater Circuit High Input · **P1151** HO2S Bank 2 Sensor 1 Signal Below 0.45v AF Ratio Too Lean · **P1151** Lack of Upstream Heated Oxygen Sensor Switch Sensor Indicate · **P1151** O2 Sensor Heater Circuit Signal Intermittent Bank 2 Sensor 1 · **P0150** O2 Sensor Circuit Malfunction (Bank 2 Sensor 1) · **P0151** O2 Sensor Circuit Low Voltage (Bank 2 Sensor 1) · **P0171** System Too Lean (Bank 1) · **P0172** System Too Rich (Bank 1)

See it working

Watch the animated explainer [How a CVT Works: Belt and Pulley Transmission](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/mazda-p1150/>

