

BMW · POWERTRAIN

P1094

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1094 · BMW

O2 Sensor Circuit Slow Response in Rich Control Range Bank 2 Sensor 1

P1094 on a BMW means the engine computer has detected that the upstream oxygen sensor on bank 2 (the side of the engine that does not contain cylinder 1) is responding too slowly while the fuel system is in rich control range. The sensor's voltage is not switching from rich to lean quickly enough, so the DME (Digital Motor Electronics) cannot trust its feedback for fine-tuning fuel delivery.

SYSTEM

Powertrain

CODE TYPE

BMW specific

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Often no symptoms besides the warning light, especially in early stages
- A slight hesitation or stumble during acceleration when the engine is cold
- Noticeably worse fuel economy than usual over a tank of fuel
- A rough idle that may come and go, particularly after a cold start
- Intermittent check engine light that clears itself after several drive cycles
- Failed emissions test due to high hydrocarbons or carbon monoxide

Common causes, most likely first

- 1 Aged or contaminated oxygen sensor that has become sluggish from silicone, oil ash, or coolant residue
- 2 Exhaust leak upstream of the sensor, allowing outside air to pulse past the sensing element
- 3 Wiring damage or corroded connector pins between the sensor and the DME, adding resistance to the signal circuit
- 4 A leaking fuel injector on bank 2 that keeps the mixture artificially rich and masks the sensor's normal switching
- 5 High fuel pressure from a failing fuel pressure regulator or restricted return line
- 6 A vacuum leak that affects bank 2 more than bank 1, skewing the mixture the sensor is trying to correct
- 7 A failing DME driver circuit for the sensor heater, which prevents the sensor from reaching operating temperature



How to diagnose and fix it

- 1 Scan all modules for stored and pending codes, then record freeze-frame data for P1094 to see the engine speed, load, and fuel trim at the moment of failure
- 2 Inspect the bank 2 upstream oxygen sensor wiring and connector for chafing, corrosion, or oil intrusion, and check for exhaust leaks at the manifold and downpipe
- 3 Graph the bank 2 sensor 1 voltage on a scan tool while revving the engine; a healthy sensor should switch rapidly between roughly 0.1 and 0.9 volts, while a lazy sensor will drift slowly
- 4 Compare bank 2 sensor 1 switching activity against bank 1 sensor 1 to confirm the fault is isolated to one side
- 5 Check long-term and short-term fuel trims on both banks; trims that are heavily negative on bank 2 point to a rich condition rather than a sensor fault
- 6 Test the sensor heater circuit resistance and supply voltage at the connector to rule out a heater or wiring problem before condemning the sensor
- 7 Replace the bank 2 upstream oxygen sensor with a quality part, clear the codes, and complete a drive cycle to verify the monitor runs and passes

What a slow O2 sensor really tells you

- A lazy oxygen sensor often sets P1094 without ever setting a heater code, because the heater circuit can still pass its resistance check while the sensing element itself is contaminated and slow to respond.
- Technicians who replace the sensor without graphing the signal first frequently miss an exhaust leak at the manifold gasket, which lets fresh air pulse past the sensor and mimics a slow response.
- Heavily negative fuel trims on bank 2 alongside P1094 usually mean a leaking injector or high fuel pressure is the root cause, and a new sensor will not fix the underlying rich condition.
- On many BMW engines, bank 2 is the harder side to reach, so a connector that was not fully seated during a previous repair is a common cause of this code appearing after unrelated service.
- The DME compares bank 2 sensor 1 against bank 1 sensor 1, so a slow bank 1 sensor can sometimes cause a bank 2 code to set if the comparison logic is skewed by a shared reference.

Can I keep driving with P1094?

You can usually keep driving short distances at moderate speeds, but avoid heavy acceleration and long trips because the rich condition can overheat the catalytic converter over time. Have the fault diagnosed soon, especially if the check engine light starts flashing or fuel economy drops sharply.

Tools that help

- OBD-II scan tool with live data graphing capability
- Digital multimeter for heater circuit and wiring checks
- Oxygen sensor socket with a slot for the wiring harness
- Propane enrichment tool or smoke machine for vacuum and exhaust leak testing
- Factory service information or a capable aftermarket scan tool for BMW-specific live data



Reading P1094

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

Often seen with

P1093 Tumble Generator Valve #2 LH Malfunction Stuck Close · **P1093** Pre-Catalyst Fuel Trim Too Rich Bank 2
 · **P0150** O2 Sensor Circuit Malfunction (Bank 2 Sensor 1) · **P0153** O2 Sensor Circuit Slow Response (Bank 2 Sensor 1)
 · **P0172** System Too Rich (Bank 1) · **P0175** System Too Rich (Bank 2)

See it working

Watch the animated explainer [How Hydraulic Brakes Work: Pedal to Caliper](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/bmw-p1094/>

