

GENERIC · POWERTRAIN

P0451

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0451

Evaporative Emission System Pressure Sensor/Switch Range/Performance

P0451 means the engine computer has detected that the evaporative emission (EVAP) system pressure sensor is reporting a signal that is outside its expected range or is not changing as it should. The computer compares the sensor voltage to known limits and flags the code when the reading is stuck, erratic, or implausible for the current operating conditions.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Low

FIX DIFFICULTY

Intermediate

AREA

Auxiliary emission controls

Symptoms you may notice

- Often no symptoms besides the warning light
- A slight fuel odor may be noticed around the vehicle
- Rough idle or hesitation in rare cases if the sensor fault affects fuel trim
- The check engine light may clear and reset intermittently
- Failed emissions inspection due to the stored code

Common causes, most likely first

- 1 Faulty EVAP pressure sensor (also called fuel tank pressure sensor)
- 2 Damaged or corroded wiring or connector at the sensor
- 3 Leaking or disconnected EVAP hose or tube
- 4 Stuck or contaminated EVAP vent valve or purge valve
- 5 Failed fuel tank pressure sensor diaphragm due to age or contamination
- 6 Poor electrical ground for the sensor circuit
- 7 Engine computer (ECM/PCM) internal fault (rare)



How to diagnose and fix it

- 1 Use a scan tool to read live data from the EVAP pressure sensor and compare it to expected values with the key on, engine off, and during a purge cycle.
- 2 Visually inspect the sensor, connector, and wiring for damage, corrosion, or loose pins; repair as needed.
- 3 Check all EVAP hoses and tubes for cracks, disconnects, or blockages; replace any faulty hose.
- 4 Test the EVAP vent valve and purge valve for proper operation and replace if stuck or leaking.
- 5 Perform a smoke test on the EVAP system to locate any leaks that could affect sensor readings.
- 6 If all external checks pass, replace the EVAP pressure sensor with a known-good unit and clear the code.
- 7 Clear codes and perform a drive cycle to verify the repair; if the code returns, diagnose the circuit further with a multimeter or oscilloscope.

What the pressure sensor range code hides

- A stuck-open purge valve can cause the pressure sensor to see vacuum at the wrong time, setting P0451 even when the sensor itself is fine.
Corroded pins in the sensor connector are a common cause that a simple code reader will never reveal, so always wiggle-test the harness.
 - Some vehicles use the same sensor for fuel level and pressure, and a failing fuel level sender can corrupt the pressure signal.
 - After replacing the sensor, a re-learn or calibration procedure may be required on certain models, so check service information before assuming the new part is defective.
- P0451 can be set by a temporary low battery voltage during cranking, so clear the code and verify it returns before replacing parts.

Can I keep driving with P0451?

The vehicle is safe to drive with P0451 because it does not affect engine performance or safety, but avoid topping off the fuel tank and have the fault diagnosed soon to prevent EVAP system damage and to pass emissions testing.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Smoke machine for EVAP leak testing
- Hand tools for hose and connector removal
- Service information for sensor voltage specifications



Reading P0451

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 4** Auxiliary emission controls.
- 51** The exact fault within that area.

Often seen with

P0442 EVAP System Leak Detected (Small) · **P0450** Evaporative Emission System Pressure Sensor/Switch · **P0452** Evaporative Emission System Pressure Sensor/Switch Low · **P0453** Evaporative Emission System Pressure Sensor/Switch High · **P0455** EVAP System Leak Detected (Large)

See it working

Watch the animated explainer [Fuel Trims Explained: Short-Term and Long-Term](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0451/>

