

GENERIC · POWERTRAIN

P0181

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0181

Fuel Temperature Sensor A Circuit Range/Performance

P0181 indicates that the engine control module has detected an out-of-range or performance fault in the fuel temperature sensor A circuit, which is typically part of the fuel rail or fuel tank sensor assembly. The computer compares the sensor signal against expected values based on engine operating conditions and flags the code when the voltage or resistance falls outside a calibrated window for a set period.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Low

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or hesitation when the engine is cold, as fuel temperature affects mixture calculations
- Decreased fuel economy due to incorrect fuel density compensation
- Hard starting or extended cranking in cold weather
- In rare cases, a slight stumble or surge during acceleration

Common causes, most likely first

- 1 Faulty fuel temperature sensor itself, due to internal failure or contamination
- 2 Damaged or corroded wiring harness or connector at the sensor
- 3 Open or short circuit in the sensor signal or ground circuit
- 4 Poor electrical connection at the engine control module harness
- 5 Fuel contamination or deposits on the sensor element affecting its response
- 6 Extreme ambient temperatures causing the sensor to read outside its expected range temporarily



How to diagnose and fix it

- 1 Connect a scan tool and record freeze-frame data to see when the code set and what the sensor reading was at that moment
- 2 Visually inspect the sensor connector and wiring for corrosion, chafing, or loose pins, and repair as needed
- 3 Measure the sensor resistance with a multimeter and compare it to the manufacturer's temperature-resistance chart
- 4 Back-probe the sensor signal wire at the ECM and check for a stable voltage that changes with temperature
- 5 Check for continuity and voltage drop on the ground circuit to rule out a bad ground
- 6 If the sensor tests out of specification, replace it and clear the code to verify the repair
- 7 If wiring and sensor are good, perform a wiggle test on the harness while monitoring live data to catch intermittent faults

What the fuel temperature sensor really does

- Many vehicles use the fuel temperature sensor as part of a combined fuel pressure and temperature sensor, so a P0181 may actually indicate a failing pressure sensor rather than a separate temperature component.
- A weak battery or charging system fault can cause erratic sensor readings that set P0181 without any defect in the sensor circuit itself.
- On some diesel engines, the fuel temperature sensor is used to calculate fuel density for injection timing, so a fault can cause subtle driveability issues that are mistaken for transmission problems.
- The code can be set by a temporary extreme cold snap if the sensor's resistance goes outside the calibrated range, and it may not return after clearing if the weather warms up.
- Aftermarket fuel additives or contaminated fuel can coat the sensor element and skew its readings, so a fuel system cleaning may resolve the code without parts replacement.

Can I keep driving with P0181?

The vehicle is generally safe to drive with P0181 because the engine control module substitutes a default fuel temperature value, but you may notice slightly reduced fuel economy or cold-start hesitation. Avoid towing heavy loads or aggressive driving until the fault is repaired, and address the code promptly to prevent secondary issues.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Back-probe kit or fine test leads
- Vehicle-specific wiring diagram
- Socket set and trim removal tools



Reading P0181

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 1** Fuel and air metering.
- 81** The exact fault within that area.

Often seen with

P0180 Fuel Temperature Sensor A Circuit Malfunction · **P0182** Fuel Temperature Sensor A Circuit Low Input · **P0183** Fuel Temperature Sensor A Circuit High Input · **P0190** Fuel Rail Pressure Sensor Circuit Malfunction · **P0191** Fuel Rail Pressure Sensor Circuit Range/Performance

See it working

Watch the animated explainer [Car Relay Test Bench: Test 4-Pin and 5-Pin Relays](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0181/>

