

GENERIC · POWERTRAIN

P06D9

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P06D9

Sensor Reference Voltage F Circuit Range/Performance

P06D9 indicates that the powertrain control module (PCM) has detected an out-of-range or performance fault on the 5-volt reference circuit designated 'F', which supplies a stable voltage to one or more sensors. The PCM monitors this circuit and sets the code when the voltage falls outside the expected operating window or behaves erratically, often affecting sensor readings that depend on it.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Computer and output circuits

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- Rough engine idle or hesitation during acceleration if the affected sensor is critical to fuel or air control.
- Poor fuel economy or increased emissions due to skewed sensor data.
- Transmission shift harshness or delayed engagement if the reference voltage feeds a transmission sensor.
- Intermittent stalling or no-start conditions in severe cases where the reference voltage drops completely.
- Erratic gauge readings or warning lights for systems sharing the same reference circuit.

Common causes, most likely first

- 1 A short to ground or chafed wire in the reference voltage circuit 'F', often due to vibration or corrosion.
- 2 A faulty sensor internally shorted and pulling the reference voltage down.
- 3 Corroded or loose connector pins at the PCM or at any sensor on the circuit.
- 4 High resistance in the circuit from damaged wiring or poor splices.
- 5 A failing PCM driver for the reference voltage output, though this is less common.
- 6 Water intrusion into a connector or sensor causing intermittent shorts.



How to diagnose and fix it

- 1 Retrieve all stored codes and freeze-frame data to identify which sensors share the 'F' reference circuit and check for related codes.
- 2 Inspect the wiring harness and connectors for the affected sensors and PCM for signs of chafing, corrosion, or loose pins.
- 3 Measure the reference voltage at each sensor connector with the key on, engine off, and compare to the specified 5 volts.
- 4 Disconnect sensors one by one to see if the reference voltage returns to normal, isolating a shorted sensor.
- 5 Perform a voltage drop test on the ground and power sides of the circuit to check for excessive resistance.
- 6 If the circuit and sensors check out, test the PCM output with a known-good load or substitute a known-good PCM for diagnosis.
- 7 Repair or replace the faulty wiring, connector, or sensor as needed, then clear codes and verify the repair with a test drive.

Reference Voltage Circuit F Diagnostic Traps

- A single shorted sensor on the shared 5-volt reference circuit can pull down the voltage for all sensors on that circuit, causing multiple unrelated codes and misleading you into replacing good parts.
- The code often sets intermittently due to a wire that only shorts when the engine moves under load, so a wiggle test of the harness while monitoring live data is essential.
- Corrosion inside a connector can create enough resistance to drop the reference voltage without any visible damage, so always inspect the terminals under magnification.
- Some vehicles use the same reference voltage for the accelerator pedal and throttle position sensors, so a fault here can trigger reduced power mode even if the engine seems fine.
- A failing PCM is rarely the root cause; confirm all wiring and sensor integrity before condemning the module, as misdiagnosis is common.

Can I keep driving with P06D9?

The vehicle may be safe to drive short distances to a repair shop if the only symptom is the warning light, but avoid heavy acceleration or towing. If the engine runs rough, stalls, or enters reduced power mode, stop driving and have it towed to prevent unsafe operation.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter with back-probing pins
- Wiring diagram for the specific vehicle
- Test light or load resistor
- Connector pin removal tools



Reading P06D9

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 6** Computer and output circuits.
- D9** The exact fault within that area.

Often seen with

P0641 Sensor Reference Voltage 'A' Circuit/Open · **P0651** Sensor Reference Voltage 'B' Circuit/Open · **P06DA** Engine Oil Pressure Control Circuit/Open · **P06DB** Engine Oil Pressure Control Circuit Low · **P06DC** Engine Oil Pressure Control Circuit High

See it working

Watch the animated explainer [How a Wideband Air-Fuel Sensor Works](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p06d9/>

