

GENERIC · POWERTRAIN

P06D3

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

## P06D3

### Sensor Reference Voltage E Circuit Low

P06D3 indicates that the powertrain control module (PCM) has detected a low voltage on the Sensor Reference Voltage E circuit, which is a 5-volt supply shared by multiple sensors. The PCM monitors this reference line and sets the code when the voltage falls below a calibrated threshold, typically because of a short to ground or an excessive load on the circuit.

| SYSTEM     | CODE TYPE           | SEVERITY | FIX DIFFICULTY | AREA                         |
|------------|---------------------|----------|----------------|------------------------------|
| Powertrain | Generic (all makes) | Medium   | Intermediate   | Computer and output circuits |

### Symptoms you may notice

- Illumination of the check engine light (malfunction indicator lamp) with no other noticeable symptoms
- Rough engine idle or hesitation during acceleration if the affected sensors include the throttle position or manifold absolute pressure sensor
- Erratic or inaccurate readings from sensors that rely on the 5-volt reference, leading to poor fuel economy or driveability complaints
- Transmission shift quality issues if the reference voltage feeds a transmission sensor
- In some cases, the engine may enter limp mode or stall if the faulty reference causes critical sensor signals to drop out

### Common causes, most likely first

- 1 A short to ground in the Sensor Reference Voltage E circuit wiring, often due to chafed insulation or pinched harness
- 2 A faulty sensor internally shorted on the reference voltage line, pulling the voltage down
- 3 Corroded or loose electrical connectors at any sensor or at the PCM, introducing resistance
- 4 Water intrusion into a connector or sensor, causing a conductive path to ground
- 5 A defective PCM driver for the reference voltage output, though this is less common
- 6 Aftermarket accessories or improper wiring repairs tapping into the reference circuit and overloading it



## How to diagnose and fix it

- 1 Scan all modules for related diagnostic trouble codes (DTCs) and record freeze-frame data to identify which sensors share the affected reference circuit
- 2 Visually inspect the engine harness and connectors for damage, corrosion, or signs of water intrusion, especially around sensors that use the 5-volt reference
- 3 Disconnect sensors one at a time on the affected reference circuit and observe the reference voltage with a digital multimeter; if voltage returns to normal, the last disconnected sensor is likely faulty
- 4 Measure resistance from the reference circuit to ground with the PCM and sensors disconnected to check for a short to ground
- 5 Check for continuity and voltage drop across the reference circuit wiring, repairing any high-resistance connections or damaged wires
- 6 If the wiring and sensors are good, test the PCM reference voltage output with a known-good sensor or a test light; if the PCM cannot supply the correct voltage, the PCM may require replacement or reprogramming
- 7 Clear the codes and perform a road test to verify the repair, ensuring the reference voltage remains stable under various operating conditions

## Reference Voltage E Circuit Pitfalls

- A single shorted sensor on a shared 5-volt reference line can pull down the voltage for all sensors on that circuit, causing multiple unrelated codes to set simultaneously; always check all sensors on the same reference feed.
- The PCM may set P06D3 even when the reference voltage is only intermittently low, so a wiggle test of the harness while monitoring live data can reveal an intermittent short that a static multimeter check misses.
- Aftermarket electrical accessories, such as alarm systems or add-on gauges, are often tapped into the 5-volt reference wire, overloading the circuit and setting this code without any factory component being at fault.
- A faulty ground connection for a sensor can cause the reference voltage to appear low at the PCM, so do not overlook ground integrity when diagnosing this code.
- Replacing the PCM without first ruling out a shorted sensor or wiring is a costly misdiagnosis; the PCM is rarely the root cause of a low reference voltage code.

## Can I keep driving with P06D3?

You can usually drive the vehicle short distances to a repair shop, but avoid aggressive acceleration or heavy loads because degraded sensor signals may cause poor engine performance or stalling. If the engine runs rough or enters limp mode, stop driving and have the vehicle towed to prevent safety risks.



## Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter (DMM)
- Back probe pins or breakout box
- Wiring diagram for the specific vehicle
- Test light
- Hand tools for connector and sensor removal

## Reading P06D3

|           |                                                                      |
|-----------|----------------------------------------------------------------------|
| <b>P</b>  | Powertrain: engine, transmission and emissions.                      |
| <b>0</b>  | Generic (SAE) code: it means the same thing on every OBD-II vehicle. |
| <b>6</b>  | Computer and output circuits.                                        |
| <b>D3</b> | The exact fault within that area.                                    |

## Often seen with

**P0641** Sensor Reference Voltage 'A' Circuit/Open · **P0651** Sensor Reference Voltage 'B' Circuit/Open · **P06A6** Sensor Reference Voltage A Circuit Range/Performance · **P06D2** Sensor Reference Voltage E Circuit/Open · **P06D4** Sensor Reference Voltage E Circuit High

## See it working

Watch the animated explainer [How a Knock Sensor Works: Spark Timing and Octane](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p06d3/>

