

GENERIC · POWERTRAIN

P06A7

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P06A7

Sensor Reference Voltage B Circuit Range/Performance

P06A7 indicates that the powertrain control module (PCM) has detected an out-of-range or performance fault in the reference voltage supply circuit designated as 'B', which typically feeds multiple sensors such as the throttle position sensor, accelerator pedal sensor, or manifold absolute pressure sensor. The computer monitors the voltage level on this shared reference line and sets the code when the signal falls outside the expected operating window or behaves erratically.

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

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough or unstable engine idle, sometimes accompanied by stalling
- Hesitation or poor acceleration when the accelerator pedal is pressed
- Reduced fuel economy or an overly rich or lean running condition
- Intermittent operation of multiple sensors that share the reference voltage circuit
- Transmission shifting harshly or entering limp mode on some vehicles

Common causes, most likely first

- 1 A short to ground or chafed wire on the reference voltage circuit, often where the harness rubs against a metal bracket
- 2 A faulty sensor internally shorting the reference voltage line, pulling the shared voltage down for all sensors on that circuit
- 3 Corroded or loose connector terminals at any sensor or at the PCM, causing high resistance and voltage drop
- 4 A damaged PCM driver circuit for the reference voltage output, sometimes caused by an external short that overheated the internal driver
- 5 Water intrusion into a connector or sensor, leading to intermittent shorts and voltage fluctuations
- 6 Aftermarket accessories or poor previous repairs tapping into the reference voltage wire and loading the circuit



How to diagnose and fix it

- 1 Scan all modules for stored codes and freeze-frame data to identify which sensors share the affected reference voltage circuit and whether the fault is intermittent or continuous
- 2 Inspect the wiring harness and connectors for chafing, corrosion, or loose pins, focusing on areas near the engine, exhaust, and any recent repair locations
- 3 Measure the reference voltage at each sensor connector with the key on and engine off, comparing the reading to the manufacturer's specification and looking for a drop that indicates excessive load
- 4 Disconnect sensors one at a time on the affected circuit to see if the reference voltage recovers, isolating a sensor that is internally shorted
- 5 Perform a voltage drop test on the ground side of the circuit and check the PCM connector for tightness and cleanliness
- 6 If the wiring and sensors check out, test the PCM reference voltage output with a known-good load or substitute a known-good PCM to confirm internal driver failure
- 7 Repair or replace the faulty wiring, connector, sensor, or PCM as determined by the tests, then clear codes and verify the reference voltage remains stable under various operating conditions

Reference voltage faults that fool good technicians

- A single sensor shorting the reference voltage line can pull down the voltage for every sensor on that circuit, causing multiple unrelated codes that lead technicians to replace parts that are not faulty.
- The reference voltage circuit is often shared across sensors that seem unrelated, such as the throttle position sensor and the air conditioning pressure sensor, so a fault in one can disable the other.
- Intermittent P06A7 codes are frequently caused by a wire that rubs through only during certain engine movements or temperature changes, making the fault hard to reproduce in the shop.
- A weak battery or poor charging system can cause the PCM to set reference voltage codes if the supply voltage drops during cranking or under heavy electrical load.
- Aftermarket electrical accessories wired into the reference voltage line, such as gauges or alarms, can overload the circuit and trigger this code without any factory component being defective.

Can I keep driving with P06A7?

The vehicle may enter limp mode or run poorly, so avoid heavy acceleration and long trips until the fault is repaired. If the engine stalls or the throttle response becomes unpredictable, stop driving and have the vehicle towed to a repair shop.



Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter with back-probing pins
- Wiring diagram for the specific vehicle
- Breakout box or terminal test kit
- Hand tools for connector and harness inspection

Reading P06A7

- P** Powertrain: engine, transmission and emissions.
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- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
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- 6** Computer and output circuits.
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- A7** The exact fault within that area.

Often seen with

P0641 Sensor Reference Voltage 'A' Circuit/Open · **P0651** Sensor Reference Voltage 'B' Circuit/Open · **P06A5** Sensor Reference Voltage D Circuit High · **P06A6** Sensor Reference Voltage A Circuit Range/Performance · **P06A8** Sensor Reference Voltage C Circuit Range/Performance

See it working

Watch the animated explainer [How Airbags Work: A 50 km/h Crash in Slow Motion](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p06a7/>

