

GENERIC · POWERTRAIN

P0642

OBD-II TROUBLE CODE

P0642

Sensor Reference Voltage 'A' Circuit Low

P0642 means the engine control module (ECM) has detected that the 5-volt reference voltage supplied to one or more sensors on circuit 'A' has dropped below its expected operating range. The ECM monitors this reference line because many sensors rely on a stable 5-volt supply to produce accurate readings, and a low voltage can skew sensor data or cause sensors to stop reporting altogether.

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, often with no other noticeable symptoms
- Rough running or stalling if the affected sensors include throttle position or manifold pressure
- Reduced engine performance or limp mode in some vehicles
- Erratic or inaccurate readings from sensors such as the throttle position sensor or accelerator pedal position sensor
- Intermittent misfire or poor fuel economy due to skewed sensor inputs
- Failure of other sensors sharing the same 5-volt reference circuit

Common causes, most likely first

- 1 A short to ground in the 5-volt reference wire, often due to chafed insulation or a pinched harness
- 2 A faulty sensor internally shorted on the reference circuit, pulling the voltage down
- 3 Corroded or loose connector terminals at a sensor or the ECM, increasing resistance
- 4 Water intrusion into a connector or sensor, causing a partial short
- 5 A damaged ECM driver circuit, though this is less common
- 6 Aftermarket accessories or poor previous repairs tapping into the reference wire



How to diagnose and fix it

- 1 Scan all modules for related codes and record freeze-frame data to identify which sensor circuit is affected
- 2 Visually inspect the harness and connectors for the sensors on the 5-volt reference circuit 'A' for damage, corrosion, or contamination
- 3 Disconnect sensors one at a time on that reference circuit and observe whether the reference voltage returns to normal, isolating a shorted sensor
- 4 Measure resistance to ground on the reference wire with all sensors disconnected to check for a harness short
- 5 Repair or replace any damaged wiring, terminals, or connectors found during inspection
- 6 Replace the sensor that is internally shorting the reference voltage if identified
- 7 Clear codes and verify the reference voltage is stable and within specification under various operating conditions

What the 5-volt reference really tells you

- A low reference voltage often affects multiple sensors at once, so the code may be accompanied by other sensor codes that seem unrelated but share the same reference circuit.
- The ECM may set P0642 even when the vehicle runs normally, because the reference voltage can drop only intermittently under certain conditions such as vibration or temperature changes.
- A common misdiagnosis is replacing the sensor that triggered a related code, when the actual fault is a shorted sensor elsewhere on the same reference line pulling the voltage down for everyone.
- Aftermarket electrical accessories wired into the 5-volt reference circuit can cause this code, so always check for non-factory wiring before condemning a component.
- The reference voltage 'A' circuit may be shared with the accelerator pedal position sensor on some vehicles, so a low voltage can cause reduced power or limp mode without any obvious sensor failure.

Can I keep driving with P0642?

You can usually drive the vehicle to a repair shop if it runs normally, but avoid heavy acceleration or long trips because a low reference voltage can cause unpredictable sensor behavior and reduced engine performance. If the engine runs rough, stalls, or enters limp mode, stop driving and have it towed to prevent unsafe operation.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the affected vehicle
- Back probe pins or breakout box
- Contact cleaner and dielectric grease



Reading P0642

- 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.
- 42** The exact fault within that area.

Often seen with

P0641 Sensor Reference Voltage 'A' Circuit/Open · **P0643** Sensor Reference Voltage 'A' Circuit High · **P0651** Sensor Reference Voltage 'B' Circuit/Open · **P2122** Accelerator Pedal Position Sensor D Circuit Low · **P2135** Throttle/Pedal Position Sensor A/B Voltage Correlation

See it working

Watch the animated explainer [Master the Four-Stroke Engine Cycle](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0642/>

