

GENERIC · POWERTRAIN

P06A1

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P06A1

Variable A/C Compressor Control Circuit Low

P06A1 indicates that the powertrain control module (PCM) has detected an abnormally low voltage on the control circuit for the variable air conditioning (A/C) compressor. The PCM commands the compressor to stroke or change displacement via a control valve, and the circuit voltage is lower than expected, which can prevent proper A/C operation or trigger a fault.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Computer and output circuits

Symptoms you may notice

- The A/C may not blow cold air, or cooling performance may be inconsistent.
- The A/C compressor clutch may not engage, or the compressor may run at a fixed displacement.
- The check engine light (malfunction indicator lamp) is illuminated.
- Often no symptoms besides the warning light, especially if the A/C system still functions adequately.
- Possible electrical issues such as blown fuses or intermittent operation of the A/C compressor.
- The climate control system may default to a fail-safe mode, reducing cooling or disabling A/C entirely.

Common causes, most likely first

- 1 A short to ground or open circuit in the variable A/C compressor control circuit wiring.
- 2 Faulty variable A/C compressor control solenoid or valve.
- 3 Corroded, loose, or damaged electrical connector at the compressor or PCM.
- 4 Blown fuse or faulty relay supplying power to the A/C compressor control circuit.
- 5 Failed PCM driver for the A/C compressor control circuit (rare but possible).
- 6 Aftermarket or damaged electrical accessories interfering with the circuit.
- 7 Moisture intrusion or physical damage to the wiring harness.



How to diagnose and fix it

- 1 Verify the code and check for any related A/C system codes using a scan tool.
- 2 Inspect the A/C compressor control circuit wiring and connectors for damage, corrosion, or looseness.
- 3 Check the fuse and relay associated with the A/C compressor control circuit and replace if necessary.
- 4 Measure resistance and voltage on the control circuit to identify shorts or opens, comparing to manufacturer specifications.
- 5 Test the variable A/C compressor control solenoid for proper resistance and operation; replace if faulty.
- 6 If the circuit and solenoid are good, check the PCM output signal and wiring back to the PCM; repair as needed.
- 7 Clear the code and verify the repair by running the A/C system and monitoring live data for the control circuit.

Before you replace the A/C compressor

- A low voltage on the control circuit often results from a poor ground connection or a chafed wire, not a failed compressor, so always perform a thorough visual inspection first.
Some vehicles use a variable displacement compressor without a traditional clutch; the control valve receives a pulse-width modulated signal, and a low circuit voltage can cause the compressor to default to full stroke or no stroke.
- The PCM may set P06A1 if the control circuit voltage is low only under certain conditions, such as when the A/C is commanded on, so intermittent faults can be missed during a quick check.
- A weak battery or charging system issue can cause low voltage on multiple circuits, including the A/C control circuit, so check the vehicle's overall electrical health before condemning components.
- Replacing the A/C compressor without diagnosing the control circuit can lead to repeat failures if the underlying wiring or connector issue is not corrected.

Can I keep driving with P06A1?

You can generally drive the vehicle with this code, but the A/C may not function properly, which could be uncomfortable in hot weather. Avoid using the A/C system until the fault is repaired to prevent potential further damage to the compressor or electrical components.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific vehicle
- Basic hand tools (screwdrivers, socket set)
- Electrical contact cleaner and dielectric grease



Reading P06A1

- 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.
- A1** The exact fault within that area.

Often seen with

P0532 A/C Refrigerant Pressure Sensor 'A' Circuit Low · **P0533** A/C Refrigerant Pressure Sensor 'A' Circuit High · **P06A0** Variable A/C Compressor Control Circuit · **P06A2** Variable A/C Compressor Control Circuit High · **P06A3** Sensor Reference Voltage D Circuit/Open

See it working

Watch the animated explainer [How an Automatic Transmission Works, Gear by Gear](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p06a1/>

