

GENERIC · POWERTRAIN

P002B

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P002B

B Camshaft Profile Actuator A Control Circuit Low Bank 1

P002B indicates that the powertrain control module (PCM) has detected an abnormally low voltage on the control circuit for the bank 1 'A' camshaft profile actuator, which is the solenoid or motor that changes valve lift or duration. The PCM commands a specific actuator position and monitors the circuit; a low-voltage condition means the circuit is shorted to ground, open, or the actuator's internal resistance is out of specification.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or unstable engine operation when the actuator is commanded to change profile
- Reduced engine power or limp mode under certain driving conditions
- Poor fuel economy or increased emissions due to incorrect valve timing
- Occasional engine misfire or hesitation during acceleration
- A noticeable change in engine sound or valve train noise if the actuator sticks

Common causes, most likely first

- 1 Faulty camshaft profile actuator solenoid with an open or shorted internal coil
- 2 Damaged or corroded wiring harness or connector at the actuator
- 3 Open circuit or high resistance in the control wire between the PCM and actuator
- 4 Short to ground in the control circuit, often from chafed insulation
- 5 Poor electrical connection at the PCM connector
- 6 Failed PCM driver for the actuator control circuit (rare)



How to diagnose and fix it

- 1 Connect a scan tool and verify P002B is current; check for related codes and freeze-frame data
- 2 Inspect the actuator connector and wiring for corrosion, looseness, or physical damage
- 3 Measure the actuator coil resistance with a multimeter and compare to the manufacturer's specification
- 4 Check for continuity and short to ground on the control circuit between the PCM and actuator
- 5 Test the actuator by applying battery voltage and ground to confirm it moves freely (if applicable)
- 6 If the circuit and actuator test good, check the PCM connector and perform a wiggle test on the harness
- 7 Replace the faulty actuator or repair the wiring as needed, then clear codes and verify the repair

What a low circuit code really means

- A low-voltage code often results from a short to ground in the wiring, not from a failed actuator, so always inspect the harness before replacing parts.
- Some vehicles use a two-wire actuator that is pulse-width modulated; a low duty cycle command can set this code even when the actuator is functional.
- Oil sludge or debris can cause the actuator to stick, which may indirectly set a circuit code if the PCM sees unexpected current draw.
- The code can be set intermittently by a loose connector that only loses contact during vibration or temperature changes.
- A faulty PCM is rarely the cause, but a shorted actuator can damage the PCM driver, so always check the actuator before installing a new PCM.

Can I keep driving with P002B?

You can usually drive the vehicle with P002B, but avoid aggressive acceleration and heavy loads because the engine may enter limp mode or run with reduced power. Have the fault diagnosed soon to prevent potential catalytic converter damage from incorrect valve timing.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wire repair kit with crimpers and heat shrink
- Electrical contact cleaner
- Factory service information for circuit specifications



Reading P002B

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 0** Fuel and air metering and auxiliary emission controls.
- 2B** The exact fault within that area.

Often seen with

P0010 'A' Camshaft Position Actuator Circuit (Bank 1) · **P0011** 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P0020** 'A' Camshaft Position Actuator Circuit (Bank 2) · **P002A** B Camshaft Profile Actuator A Control Circuit/Open Bank 1 · **P002C** B Camshaft Profile Actuator A Control Circuit High Bank 1

See it working

Watch the animated explainer [Four-Stroke Engine Cutaway: Intake to Exhaust](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p002b/>

