

GENERIC · POWERTRAIN

P2B40

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2B40

A Camshaft Position Actuator Position Sensor B Range/Performance Bank 1

P2B40 indicates that the powertrain control module (PCM) has detected a range or performance problem with the camshaft position actuator position sensor for bank 1, sensor B. The PCM compares the sensor's reported actuator position against the commanded position and expected values, and it sets this code when the signal falls outside the acceptable range or does not respond as expected within a calibrated time.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or unstable engine operation, especially when cold
- Reduced engine power or limp mode under certain conditions
- Poor fuel economy or increased emissions
- Engine hesitation or stumble during acceleration
- In rare cases, a no-start condition if the actuator is stuck in an adverse position

Common causes, most likely first

- 1 Faulty camshaft position actuator position sensor (bank 1 sensor B)
- 2 Wiring damage or poor electrical connection at the sensor or PCM
- 3 Contaminated or degraded engine oil affecting actuator response
- 4 Sticking or failing camshaft position actuator solenoid
- 5 Mechanical binding in the camshaft phaser or actuator assembly
- 6 PCM software issue or internal fault (less common)



How to diagnose and fix it

- 1 Perform a visual inspection of the sensor, wiring, and connectors for damage or corrosion
- 2 Check engine oil level and condition; change oil if contaminated or degraded
- 3 Use a scan tool to monitor camshaft actuator position sensor data and compare commanded versus actual position
- 4 Test the sensor's electrical circuit with a multimeter for proper voltage, ground, and signal integrity
- 5 Remove and inspect the camshaft position actuator solenoid for debris or sticking; clean or replace as needed
- 6 If the sensor signal is erratic or out of range, replace the camshaft position actuator position sensor
- 7 After repairs, clear codes and verify the actuator responds correctly during a road test

Oil quality and sensor signal checks

- Degraded or incorrect viscosity engine oil is a frequently overlooked cause because it slows actuator response and can set a performance code without any hard failure.
- The sensor may test fine statically but fail only when the engine is hot or under load, so live data monitoring during a test drive is essential.
- A sticking actuator solenoid can mimic a faulty sensor, so always verify solenoid operation before replacing the sensor.
- Wiring harness chafing near the camshaft cover or intake manifold is a common hidden cause that visual inspection alone may miss without wiggle tests.
- This code does not always mean the sensor is defective; it can be set by mechanical phaser issues or even low oil pressure affecting actuator movement.

Can I keep driving with P2B40?

You can usually continue driving with this code if the engine runs smoothly, but avoid heavy acceleration or sustained high speeds until it is diagnosed. If you notice rough running, reduced power, or stalling, have the vehicle inspected promptly to prevent further damage.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Basic hand tools (socket set, screwdrivers)
- Feeler gauges or feeler gauge set
- Oil pressure gauge (optional for advanced diagnosis)



Reading P2B40

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- B** Hybrid propulsion.
- 40** 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 · **P0016** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor A) · **P2B41** A Camshaft Position Actuator Position Sensor B Circuit Low B · **P2B42** A Camshaft Position Actuator Position Sensor B Circuit High

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/p2b40/>

