

GENERIC · POWERTRAIN

P2B39

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2B39

B Camshaft Profile Actuator B Control Circuit/Open Bank 1

P2B39 indicates that the powertrain control module has detected an open circuit or loss of continuity in the control circuit for the Bank 1 'B' camshaft profile actuator, which is the component that changes valve lift or duration on that bank. The computer commands the actuator to move, but the electrical feedback on the control wire does not match the expected voltage or current, so it flags the circuit as open.

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
- Reduced engine power or a limp-home mode if the actuator is stuck in a default position
- Rough idle or poor low-speed drivability because the cam profile stays fixed
- A noticeable loss of fuel economy or increased emissions output
- Intermittent hesitation or stumble during light acceleration
- A faint clicking or ticking noise from the valve cover area if the actuator is trying to move but lacks a complete circuit

Common causes, most likely first

- 1 Broken or chafed wire in the actuator control circuit, often near a connector or where the harness flexes
- 2 Corroded, loose, or water-intruded electrical connector at the camshaft profile actuator
- 3 Failed camshaft profile actuator solenoid or its internal coil winding
- 4 Open circuit inside the actuator pigtail or a pushed-back terminal in the connector
- 5 Faulty powertrain control module driver for that circuit, though this is less common
- 6 Engine oil sludge or debris blocking the actuator screen and causing the solenoid to overheat and fail open



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data to confirm P2B39 is the only circuit code for that actuator
- 2 Inspect the actuator connector and harness for corrosion, chafing, or pushed-back pins, and perform a wiggle test while watching live data
- 3 Measure resistance across the actuator solenoid terminals and compare to the manufacturer's specification to rule out an open coil
- 4 Check for battery voltage on the control circuit with the key on and the actuator commanded, using a noid light or multimeter to verify the driver is grounding the circuit
- 5 Repair any open or high-resistance wiring by soldering and sealing the repair, then clear the code and verify the actuator moves through its full range
- 6 If the circuit is intact but the actuator does not respond, replace the camshaft profile actuator and recheck oil condition and screen cleanliness
- 7 After repair, run a manufacturer-specific actuator sweep or drive cycle to confirm the code does not return and the cam profile changes as commanded

What the open circuit really means

- An open circuit code does not always mean the actuator is dead; a single chafed wire near the valve cover can set P2B39 while the solenoid itself tests perfectly good.
- Oil sludge and blocked screens are a common hidden cause because the actuator overheats when it cannot move freely, eventually burning open the internal coil and setting this code.
- Technicians sometimes replace the actuator only to have the code return because the connector terminal was spread and making poor contact, so always load-test the circuit rather than just checking for voltage.
- A failing camshaft profile actuator can set P2B39 alongside camshaft position correlation codes, so do not chase the position sensor until the actuator circuit is proven good.
- On some engines the actuator control circuit shares a ground path with other solenoids, so a bad ground elsewhere can mimic an open circuit on this actuator.

Can I keep driving with P2B39?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration and sustained high speeds because the engine may be running with a fixed cam profile and reduced power. If the check engine light begins flashing or the engine runs very rough, stop driving and have it towed.

Tools that help

- OBD-II scan tool with live data and bidirectional control
- Digital multimeter with resistance and voltage measurement
- Noid light or test light for circuit loading
- Wiring diagram for the specific vehicle
- Basic hand tools for connector and valve cover access



Reading P2B39

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- B** Hybrid propulsion.
- 39** The exact fault within that area.

Often seen with

P0011 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P0014** Exhaust Camshaft Position - Over-Advanced (Bank 1) · **P0016** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor A) · **P2B38** A Camshaft Profile Actuator B Control Circuit High Bank 2 · **P2B3A** B Camshaft Profile Actuator B Control Circuit Low 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/p2b39/>

