

GENERIC · POWERTRAIN

P2B33

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2B33

A Camshaft Profile Actuator B Control Circuit/Open Bank 1

P2B33 indicates that the powertrain control module (PCM) has detected an open circuit or loss of control on the control circuit for the camshaft profile actuator on bank 1. This actuator changes the camshaft lobe profile to optimize engine breathing, and an open circuit prevents the PCM from commanding the actuator, often resulting in a fixed cam profile and reduced performance.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Reduced engine power or sluggish acceleration, especially at higher engine speeds
- Rough idle or unstable engine operation
- Decreased fuel economy due to suboptimal valve timing
- In some cases, the engine may enter limp mode to protect the valvetrain

Common causes, most likely first

- 1 Broken or disconnected wire in the actuator control circuit
- 2 Corroded or loose electrical connector at the camshaft profile actuator
- 3 Failed camshaft profile actuator solenoid
- 4 Open circuit inside the actuator coil
- 5 PCM driver circuit failure (less common)
- 6 Damage to the wiring harness from heat, chafing, or rodent activity

How to diagnose and fix it

- 1 Visually inspect the actuator connector and wiring for damage, corrosion, or loose pins
- 2 Check for continuity and resistance in the control circuit between the PCM and actuator
- 3 Test the actuator solenoid resistance and compare to manufacturer specifications
- 4 Verify power and ground supplies to the actuator with a multimeter or test light
- 5 Repair or replace damaged wiring or connectors as needed
- 6 Replace the camshaft profile actuator if it fails electrical testing
- 7 Clear the code and perform a road test to confirm the repair



Don't overlook the wiring harness

- A common oversight is replacing the actuator without checking the wiring harness for chafed or broken wires, especially near hot exhaust components.
- The code can be set intermittently by a loose connector that makes contact only under certain vibration or temperature conditions.
- Some vehicles use a two-wire actuator while others use a three-wire design; misdiagnosis can occur if the circuit type is not confirmed before testing.
- An open circuit in the control circuit may also be caused by a failed PCM driver, but this is rare and should only be suspected after all other possibilities are ruled out.
- This code is often accompanied by other camshaft actuator codes, so a full system scan is essential to avoid chasing the wrong fault.

Can I keep driving with P2B33?

Driving with this code is generally safe for short distances, but the engine may lack power and fuel economy may suffer. Avoid aggressive acceleration or heavy loads until the fault is repaired, as prolonged driving with a disabled actuator could lead to other performance issues.

Tools that help

- OBD-II scan tool
- Digital multimeter
- Wiring diagram for the specific vehicle
- Test light
- Socket set and basic hand tools

Reading P2B33

P	Powertrain: engine, transmission and emissions.
2	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
B	Hybrid propulsion.
33	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 · **P2B34** A Camshaft Profile Actuator B Control Circuit Low Bank 1 · **P2B35** A Camshaft Profile Actuator B Control Circuit High Bank 1 · **P2B36** A Camshaft Profile Actuator B Control Circuit/Open Bank 2



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/p2b33/>

