

GENERIC · POWERTRAIN

P005D

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P005D

B Camshaft Profile Actuator A Control Stuck On Bank 2

P005D indicates that the engine computer has commanded the bank 2 B camshaft profile actuator to change valve timing, but the actuator circuit remains energized or stuck in the commanded position longer than expected. The computer detects this by monitoring the actuator control circuit and recognizing that the electrical current or response does not return to the expected state when the command is removed.

SYSTEM Powertrain	CODE TYPE Generic (all makes)	SEVERITY Medium	FIX DIFFICULTY Intermediate	AREA Fuel and air metering and auxiliary emission controls
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Symptoms you may notice

- Illumination of the check engine light, often with no other symptoms noticed by the driver
- Rough idle or unstable engine operation, particularly when the engine is cold
- Reduced engine power or sluggish acceleration due to incorrect valve timing
- Decreased fuel economy as the engine management system cannot optimize valve events
- Occasional engine misfire or hesitation during light-throttle cruising
- A noticeable change in engine sound or exhaust note under load

Common causes, most likely first

- 1 Faulty camshaft profile actuator solenoid that is mechanically stuck in the energized position
- 2 Contaminated or degraded engine oil causing the actuator spool valve to stick
- 3 Wiring harness damage such as a short to power or chafed insulation on the actuator control circuit
- 4 Corroded or loose electrical connector at the actuator solenoid
- 5 Failed engine control module driver circuit that keeps the actuator grounded continuously
- 6 Restricted oil passage or low oil pressure preventing the actuator from returning to its default position



How to diagnose and fix it

- 1 Verify oil condition and level, then perform an oil and filter change if the oil is dirty or overdue
- 2 Use a scan tool to command the bank 2 B camshaft profile actuator on and off while watching for circuit response and listening for actuator movement
- 3 Inspect the actuator solenoid connector and wiring for corrosion, chafing, or a short to power, repairing as needed
- 4 Measure resistance of the actuator solenoid and compare to manufacturer specifications to rule out an internally shorted coil
- 5 Remove and inspect the actuator solenoid for debris or mechanical binding, cleaning or replacing it if it does not move freely
- 6 Check oil pressure at the actuator feed port to confirm the actuator receives adequate pressure to return to its rest position
- 7 If all electrical and mechanical checks pass, test the engine control module output circuit for a stuck driver and replace the module only as a last resort

Why a Stuck Actuator Is Often an Oil Problem

- A sticking actuator is frequently caused by sludge or varnish from extended oil change intervals, so the solenoid tests fine electrically but binds mechanically when hot.
- The code can set intermittently and clear on its own after an oil change, leading some drivers to believe the problem is resolved when the underlying wear remains.
- A short to power on the control wire will mimic a failed actuator, so technicians who replace the solenoid without checking the harness often see the code return immediately.
- On engines with variable valve timing, a stuck profile actuator can cause camshaft timing to remain advanced, which may set companion codes for camshaft position correlation that point to the wrong bank.
- The actuator may only stick when oil temperature is high, so a cold-engine resistance test can pass even though the part is faulty under real operating conditions.

Can I keep driving with P005D?

The vehicle can usually be driven short distances to a repair shop, but avoid heavy acceleration and sustained high speeds because incorrect valve timing can cause misfires and increased exhaust emissions. If the engine runs roughly or loses power, stop driving and arrange a tow to prevent damage to the catalytic converter.

Tools that help

- OBD-II scan tool with bidirectional control capability
- Digital multimeter for circuit and resistance testing
- Oil pressure gauge
- Basic hand tools including socket set and torque wrench
- Wiring diagram for the camshaft profile actuator circuit



Reading P005D

- 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.
- 5D** The exact fault within that area.

Often seen with

P0011 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P0016** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor A) · **P0021** 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P005C** B Camshaft Profile Actuator A Control Performance/Stuck Off · **P005E** Turbocharger/Supercharger Boost Control B Supply Voltage Cir

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/p005d/>

