

GENERIC · POWERTRAIN

P054B

OBD-II TROUBLE CODE

P054B

Cold Start B Camshaft Position Timing Over-Retarded Bank 1

P054B indicates that the engine computer has detected the bank 1 'B' camshaft is retarded beyond the commanded timing during a cold start, meaning the camshaft is not advancing as expected for optimal combustion and emissions. The powertrain control module sets this code when the actual camshaft position deviates from the target by more than a calibrated threshold during the cold-start phase.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Professional	Vehicle speed, idle control and auxiliary inputs

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or misfire immediately after a cold start
- Reduced engine performance or sluggish acceleration when the engine is cold
- Increased fuel consumption during warm-up
- Occasional stalling or hesitation shortly after startup
- Audible ticking or rattling from the timing chain area on some engines

Common causes, most likely first

- 1 Sludge or debris blocking the oil control valve (OCV) or variable valve timing (VVT) solenoid, restricting oil flow to the camshaft phaser
- 2 Wear or failure of the camshaft phaser (VVT actuator) itself, preventing proper timing adjustment
- 3 Low engine oil level or degraded oil that cannot maintain proper hydraulic pressure for the VVT system
- 4 Electrical fault in the VVT solenoid circuit, such as a short, open, or poor connection
- 5 Sticking or contaminated VVT solenoid screen
- 6 Timing chain stretch or misalignment affecting camshaft timing relative to the crankshaft
- 7 Engine control module (ECM) calibration issue or faulty camshaft position sensor



How to diagnose and fix it

- 1 Check engine oil level and condition; top off or change oil if it is low or dirty
- 2 Inspect the VVT solenoid and its screen for debris or sludge; clean or replace if clogged
- 3 Test the VVT solenoid electrical circuit for power, ground, and signal integrity
- 4 Verify camshaft timing marks align with crankshaft timing marks to rule out chain stretch
- 5 Use a scan tool to command the VVT solenoid and observe camshaft timing response
- 6 Replace the camshaft phaser if it fails to hold or adjust timing correctly
- 7 Reprogram or replace the ECM if all mechanical and electrical checks pass but the code persists

Cold Start VVT Faults Often Misdiagnosed

- A clogged oil control valve screen is a frequent culprit that many technicians overlook when replacing the phaser, leading to repeat failures.
- The code may set only during a cold start because oil pressure is lower and the VVT system is most sensitive to restrictions at that time.
- Some engines use a separate cold-start timing strategy that commands maximum cam retard; a fault in that strategy can set P054B even if the phaser works normally when warm.
- A weak battery or poor ground can cause the VVT solenoid to act erratically during cranking, mimicking a mechanical failure.
- P054B is often accompanied by other VVT or camshaft codes, so diagnosing the root cause requires looking at the entire timing control system rather than just the 'B' camshaft.

Can I keep driving with P054B?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration or towing until the fault is diagnosed. Prolonged driving with this code may lead to poor fuel economy, increased emissions, and potential damage to the camshaft phaser or timing components.

Tools that help

- OBD-II scan tool with live data and bidirectional control
- Digital multimeter for circuit testing
- Oil pressure gauge
- Timing light or camshaft position sensor tool
- Basic hand tools (wrenches, sockets, screwdrivers)



Reading P054B

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 5** Vehicle speed, idle control and auxiliary inputs.
- 4B** The exact fault within that area.

Often seen with

P0011 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P0012** 'A' Camshaft Position - Timing Over-Retarded (Bank 1) · **P054A** Cold Start B Camshaft Position Timing Over-Advanced Bank 1 · **P054C** Cold Start B Camshaft Position Timing Over-Advanced Bank 2 · **P054D** Cold Start B Camshaft Position Timing Over-Retarded 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/p054b/>

