

GENERIC · POWERTRAIN

P0022

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0022

'A' Camshaft Position - Timing Over-Retarded (Bank 2)

P0022 means the engine computer has detected that the camshaft on bank 2 is not advancing to the commanded timing and is staying over-retarded relative to the crankshaft. The powertrain control module compares the camshaft position sensor signal to the crankshaft position sensor signal and sets this code when the measured cam timing error exceeds a calibrated threshold for a set time.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other symptoms noticed by the driver
- Rough idle or unstable engine speed, especially when cold
- Reduced engine power or sluggish acceleration due to retarded cam timing
- Poor fuel economy or increased emissions output
- Engine misfire or hesitation under load
- Unusual engine noise from the timing chain or variable valve timing area

Common causes, most likely first

- 1 Dirty, sludged, or low engine oil preventing the variable valve timing phaser from advancing
- 2 Failed or sticking variable valve timing solenoid on bank 2
- 3 Worn or stretched timing chain causing incorrect cam-to-crank relationship
- 4 Failed camshaft phaser or timing chain tensioner on bank 2
- 5 Electrical fault in the variable valve timing solenoid circuit, such as open or shorted wiring
- 6 Restricted oil passage or clogged oil control valve screen feeding the phaser
- 7 Rarely, a faulty camshaft position sensor or crankshaft position sensor giving inaccurate timing signals



How to diagnose and fix it

- 1 Check engine oil level and condition; change oil and filter if sludged or overdue
- 2 Scan live data for commanded versus actual cam timing on bank 2 to confirm the fault
- 3 Inspect and test the bank 2 variable valve timing solenoid for resistance and proper operation
- 4 Check the solenoid wiring and connector for corrosion, opens, or shorts
- 5 Remove and clean the oil control valve screen and passages if accessible
- 6 Verify timing chain condition and alignment marks; replace chain and tensioner if stretched
- 7 Replace the camshaft phaser if it fails to hold or change timing after oil and solenoid repairs

Oil quality drives this code more than sensors

- A large share of P0022 cases are caused by neglected oil changes that sludge the phaser and solenoid rather than by a failed sensor or phaser itself.
- The code can set intermittently and clear on its own after an oil change, leading owners to believe the problem is fixed when the underlying wear remains.
- Technicians sometimes replace the camshaft position sensor first, but the sensor is rarely the cause because the code reflects a timing error, not a missing signal.
- Bank 2 refers to the cylinder bank that does not contain cylinder number one, so confirm bank identification before ordering parts for the wrong side.
- A stretched timing chain can mimic a failed phaser, so always verify chain stretch and alignment before condemning the phaser.

Can I keep driving with P0022?

You can usually drive the vehicle short distances to a repair shop, but avoid hard acceleration and sustained high-speed driving because retarded cam timing can cause misfires and overheating of the catalytic converter. If the engine runs roughly or loses power noticeably, stop driving and arrange a tow.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter for testing solenoid circuits
- Oil filter wrench and drain pan for oil change
- Basic hand tools for removing solenoid and valve covers
- Timing light or scan tool with cam-crank correlation display



Reading P0022

- 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.
- 22** 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) · **P0016** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor A) · **P0021** 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P0026** Intake Valve Control Solenoid Circuit Range/Performance (Ban

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/p0022/>

