

GENERIC · POWERTRAIN

P020A

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P020A

Cylinder 1 Injection Timing

P020A indicates that the powertrain control module has detected an abnormal injection timing event for cylinder number one, meaning the fuel injector did not open or close when the engine computer commanded it to. The computer monitors the injector circuit and compares commanded timing to actual electrical response, and it sets this code when the deviation exceeds a calibrated threshold.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Fuel and air metering (injector circuits)

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or a noticeable misfire sensation, especially when the engine is cold
- Reduced engine power or hesitation during acceleration
- Increased fuel consumption as the computer adjusts injection strategy
- Occasional hard starting or extended cranking before the engine fires
- A faint fuel odor from the exhaust or engine bay in severe cases

Common causes, most likely first

- 1 Faulty fuel injector for cylinder one with a sticking or slow-responding solenoid
- 2 Damaged or corroded electrical connector at the cylinder one injector
- 3 Chafed or open wiring in the injector harness near the cylinder one circuit
- 4 Failed injector driver inside the powertrain control module
- 5 Low fuel pressure or a restricted fuel filter affecting injector response time
- 6 Contaminated engine oil or fuel causing injector pintle sticking
- 7 Aftermarket or incorrect injector installed during prior repairs



How to diagnose and fix it

- 1 Connect a scan tool and record freeze-frame data to confirm when P020A sets and check for related misfire or injector circuit codes
- 2 Inspect the cylinder one injector connector and harness for corrosion, chafing, or loose pins, and repair as needed
- 3 Measure injector coil resistance with a multimeter and compare it to the manufacturer's specification for that engine
- 4 Perform an injector balance or cylinder contribution test to see whether cylinder one is under- or over-fueling
- 5 Check fuel pressure and volume at the rail to rule out a supply problem that mimics an injector timing fault
- 6 Swap the cylinder one injector with a known-good injector from another cylinder and see whether the code follows the injector
- 7 If the circuit and injector test good, scope the injector control wire at the PCM to verify the driver signal and replace the PCM only if the driver is confirmed faulty

What P020A really tells you about cylinder one

- P020A is often set by a dirty or sticking injector that still flows fuel but responds too slowly, so a simple resistance check can pass while the injector is still the culprit.
- A weak battery or poor engine ground can cause the injector driver to misreport timing, so always verify battery voltage and ground integrity before condemning the injector.
- This code can appear after an engine wash or heavy rain if water enters the injector connector, causing intermittent timing errors that clear once the connector dries.
- Some vehicles set P020A when the wrong viscosity oil is used in cold weather, because thicker oil slightly slows camshaft-driven injection pump response on certain diesel engines.
- Do not replace the PCM based on P020A alone; the driver circuit is rarely the cause, and a shorted injector can damage a new PCM if the underlying fault is not fixed first.

Can I keep driving with P020A?

You can usually drive short distances to a repair shop, but avoid heavy acceleration, towing, or long highway trips because continued driving with a misfiring cylinder can overheat the catalytic converter and cause costly damage. If the check engine light begins flashing, stop driving and have the vehicle towed.

Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Digital multimeter with resistance and voltage measurement
- Fuel pressure gauge
- Noid light or injector pulse tester
- Automotive oscilloscope for injector waveform analysis
- Basic hand tools for connector and injector access



Reading P020A

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 2** Fuel and air metering (injector circuits).
- 0A** The exact fault within that area.

Often seen with

P0201 Injector Circuit Malfunction - Cylinder 1 · **P0202** Injector Circuit Malfunction - Cylinder 2 · **P0261** Cylinder 1 Injector Circuit Low · **P0301** Cylinder 1 Misfire Detected · **P2146** Fuel Injector Group 'A' Supply Voltage Circuit/Open

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/p020a/>

