

GENERIC · POWERTRAIN

P024E

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P024E

Charge Air Cooler Bypass Position Sensor A Circuit Low

P024E indicates that the powertrain control module (PCM) has detected a low voltage signal from the charge air cooler (CAC) bypass position sensor on circuit A. The sensor monitors the position of the bypass valve that directs intake air either through or around the CAC, and a low signal means the PCM sees a voltage below the expected range for the current operating conditions.

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

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- Reduced engine power or limp mode under heavy load or during regeneration.
- Poor fuel economy or sluggish acceleration due to incorrect bypass valve operation.
- Rough idle or hesitation if the bypass valve is stuck open or closed.
- In rare cases, a noticeable whistle or whoosh from the intake system if the valve is stuck.

Common causes, most likely first

- 1 Faulty CAC bypass position sensor (internal short to ground or open circuit).
- 2 Damaged or corroded wiring harness or connector at the sensor or PCM.
- 3 Sticking or mechanically binding bypass valve actuator, causing the sensor to read out of range.
- 4 Contaminated or damaged sensor due to oil or debris ingress.
- 5 PCM software issue or internal fault (less common).
- 6 Poor ground connection for the sensor circuit.



How to diagnose and fix it

- 1 Use a scan tool to verify the P024E code and check for any related codes; record freeze-frame data.
- 2 Visually inspect the sensor, connector, and wiring for damage, corrosion, or loose pins; repair as needed.
- 3 Measure reference voltage (typically 5V) and ground at the sensor connector with the key on; if missing, trace circuit back to PCM.
- 4 Backprobe the sensor signal wire and compare voltage to the manufacturer's specification while moving the bypass valve through its range.
- 5 If voltage is low or erratic, disconnect the sensor and check for a short to ground on the signal circuit; repair if found.
- 6 Test the bypass valve actuator for free movement and proper operation; replace if binding or faulty.
- 7 If all circuits and components test good, suspect the PCM; reprogram or replace only after confirming no other faults.

Don't overlook the bypass valve itself

- A low signal code often results from a short to ground in the sensor wiring, not a failed sensor, so always check the harness before replacing parts.
- The CAC bypass valve may be vacuum-operated or electrically actuated; a stuck valve can mimic a sensor fault and set P024E even when the sensor is good.
- Oil contamination from a leaking turbocharger seal can coat the sensor and cause a low voltage signal that may not set other codes.
- On some vehicles, P024E may be accompanied by a derate or reduced power strategy, but the driver might not notice until towing or climbing a grade.
- A poor ground at the sensor can cause a low signal that appears as a sensor failure; always verify ground integrity with a load test.

Can I keep driving with P024E?

You can generally drive with P024E, but avoid heavy acceleration or towing until repaired, as the engine may enter limp mode and reduce power unexpectedly. If the check engine light flashes or you notice severe power loss, stop driving and seek service.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific vehicle
- Hand tools for connector and sensor removal
- Vacuum pump or actuator tester (if vacuum-operated)



Reading P024E

- 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).
- 4E** The exact fault within that area.

Often seen with

P00AF Turbocharger/Supercharger Boost Control A Module Performance · **P0234** Engine Overboost Condition
· **P024D** Charge Air Cooler Bypass Position Sensor A Circuit Range/Per Position Sensor A Circuit High · **P024F** Charge Air Cooler Bypass
Position Sensor A Circuit High · **P0299** Turbo/Supercharger Underboost

See it working

Watch the animated explainer [Turbocharger Trainer: Boost, Wastegate and Intercooler](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p024e/>

