



P024F

Charge Air Cooler Bypass Position Sensor A Circuit High

P024F indicates that the powertrain control module (PCM) has detected an abnormally high voltage on the signal circuit of the charge air cooler (CAC) bypass position sensor, which is used to monitor the position of the bypass valve that routes intake air around the intercooler. The PCM expects the sensor's signal voltage to stay within a calibrated range, and a sustained high reading typically means the circuit is open, shorted to voltage, or the sensor's internal electronics have failed.

SYSTEM Powertrain	CODE TYPE Generic (all makes)	SEVERITY Medium	FIX DIFFICULTY Intermediate	AREA 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, especially under heavy load or during acceleration.
- Poor fuel economy or sluggish throttle response due to incorrect bypass valve operation.
- Rough idle or hesitation if the bypass valve remains stuck in one position.
- In rare cases, a noticeable loss of boost pressure or abnormal turbocharger noise.

Common causes, most likely first

- 1 Open or damaged signal wire between the bypass position sensor and the PCM.
- 2 Short to voltage on the sensor signal circuit, often from chafed wiring or moisture intrusion.
- 3 Failed charge air cooler bypass position sensor, typically due to internal wear or contamination.
- 4 Corroded or loose electrical connector at the sensor or PCM.
- 5 Faulty bypass valve actuator that binds and forces the sensor out of range.
- 6 PCM internal fault, though this is uncommon and should be diagnosed last.



How to diagnose and fix it

- 1 Connect a scan tool and record the freeze-frame data for P024F, then clear the code and verify whether it returns immediately.
- 2 Visually inspect the bypass position sensor, its connector, and the wiring harness for damage, corrosion, or loose pins.
- 3 Back-probe the sensor signal circuit at the PCM and compare the voltage with the sensor's expected range; a reading near 5 volts with the sensor disconnected points to an open circuit.
- 4 Check for a short to voltage on the signal wire by measuring voltage with the sensor disconnected and the key on; any voltage above the reference value indicates a short.
- 5 Test the sensor's resistance or voltage output with a multimeter while manually moving the bypass valve through its range to confirm a smooth, linear signal.
- 6 If the sensor tests good, inspect the bypass valve and actuator for mechanical binding or carbon buildup that could force the sensor to its high limit.
- 7 Replace the faulty sensor or repair the wiring as needed, then clear codes and perform a road test to confirm the repair.

Before you replace the bypass position sensor

- A common oversight is assuming the sensor is at fault when the real problem is a chafed signal wire near the charge air cooler, where heat and vibration often damage insulation.
- The bypass valve actuator can seize or bind, causing the sensor to read high even though the sensor itself is functioning correctly, so always verify valve movement.
- On some vehicles, a low battery or charging system fault can cause the PCM to set a false high-voltage code for the sensor circuit, so check system voltage first.
- The code can be set intermittently by water intrusion into the sensor connector after driving through deep puddles or in heavy rain, which is often missed during a dry-bay inspection.
- Do not overlook the possibility of a faulty PCM ground, which can elevate signal voltages across multiple sensors and trigger P024F along with other unrelated codes.

Can I keep driving with P024F?

You can usually drive the vehicle with this code, but avoid heavy acceleration and sustained high-load conditions because the bypass valve may not operate correctly, reducing performance and potentially causing turbocharger stress. Have the fault diagnosed soon to prevent secondary damage.



Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the charge air cooler bypass circuit
- Back-probe kit or fine test leads
- Hand tools for connector and sensor removal

Reading P024F

- 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).
- 4F** 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 · **P024E** Charge Air Cooler Bypass
 Position Sensor A Circuit Low · **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/p024f/>

