

GENERIC · POWERTRAIN

P028D

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P028D

Charge Air Cooler Cooling Fan Control Circuit Low

P028D indicates that the powertrain control module (PCM) has detected an abnormally low voltage or current on the control circuit for the charge air cooler cooling fan. This fan is used on some turbocharged or supercharged engines to force air across the charge air cooler, reducing intake air temperature after the turbocharger or supercharger has compressed it. The PCM monitors the circuit and sets this code when the signal falls below the expected threshold, which usually points to a short to ground, an open circuit, or a faulty fan motor.

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 performance or power due to elevated intake air temperatures
- The charge air cooler fan may not run at all when commanded by the PCM
- Possible decrease in fuel economy as the PCM adjusts for hotter intake air
- In rare cases, the engine may enter a reduced power mode if intake temperatures become excessive

Common causes, most likely first

- 1 Faulty charge air cooler cooling fan motor (shorted or open internally)
- 2 Damaged or disconnected wiring harness to the fan motor or PCM
- 3 Corroded or loose electrical connector at the fan or PCM
- 4 Blown fuse or faulty relay supplying power to the fan circuit
- 5 PCM internal driver failure on the fan control circuit
- 6 Short to ground in the control wire between the PCM and the fan



How to diagnose and fix it

- 1 Verify the code with a scan tool and check for any related codes in other modules
- 2 Inspect the fan motor connector and wiring for corrosion, damage, or loose pins
- 3 Check the fuse and relay that supply power to the charge air cooler fan circuit
- 4 Measure resistance across the fan motor terminals to check for an open or shorted winding
- 5 Backprobe the control circuit at the PCM and at the fan to check for a short to ground or an open circuit
- 6 Command the fan on with a scan tool and observe whether it activates and whether the code returns
- 7 If all wiring and components test good, suspect the PCM and perform further diagnostics before replacement

What the code does not always mean

- A low circuit code can be set by a fan motor that is drawing too much current due to a mechanical binding or worn bearing, not just by a short to ground.
- Some vehicles use a pulse-width modulated (PWM) signal to control the fan, and a failed driver in the PCM can mimic a wiring fault, so always test the circuit before replacing the fan.
- The charge air cooler fan may only run under specific conditions such as high ambient temperature or heavy engine load, so a fan that does not run during a quick visual check may still be functional.
- A poor ground connection at the fan motor or chassis can cause a low voltage condition on the control circuit and set this code without any visible damage to the wiring.
- This code is often misdiagnosed as a faulty fan when the real issue is a corroded connector pin that causes intermittent low signal, so a thorough wiggle test and voltage drop test are essential.

Can I keep driving with P028D?

You can generally drive the vehicle with this code, but avoid heavy acceleration or sustained high-load driving because the charge air cooler fan may not function, leading to higher intake air temperatures and reduced performance. If the check engine light begins flashing or the engine enters limp mode, stop driving and seek service immediately.

Tools that help

- OBD-II scan tool with bidirectional control capability
- Digital multimeter (DMM)
- Test light
- Wiring diagram for the specific vehicle
- Socket and ratchet set
- Electrical contact cleaner



Reading P028D

- 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).
- 8D** The exact fault within that area.

Often seen with

P0234 Engine Overboost Condition · **P028C** Charge Air Cooler Cooling Fan Stuck On · **P028E** Charge Air Cooler Cooling Fan Control Circuit High · **P028F** Charge Air Cooler Cooling Fan Control Circuit Driver Perform · **P0290** Cylinder 10 Contribution/Balance

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/p028d/>

