P022C: CHARGE AIR COOLER BYPASS CONTROL A CIRCUIT HIGH

OVERVIEW

Severity	:	Medium
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$50-$100**
Can I Still Drive?	:	No

What Does The P022C Code Mean?

In forced inducted systems, they use a Charge Air Cooler or what I am going to call it, an Intercooler (IC) to help in cooling the charge air the engine uses. These work similar to a radiator.

In the IC's case, instead of cooling antifreeze, it cools air to make for a more efficient air/fuel mixture in turn, better fuel mileage, better performance etc.. The IC is part of the charge pressure side of the induction system.

The bypass valve is used just as the name implies, to let the air bypass the intercooler to be dumped into the atmosphere and/or recycled. The Engine Control Module (ECM) uses it to adjust valve according to current engine conditions and needs.

The ECM illuminates the check engine light with P022C and associated codes when it monitors a condition outside of a specific range within the intercooler's bypass control circuit and/or system.

This code may be cause by a mechanical and/or electrical fault. If I had to guess here, I would lean towards a mechanical problems more likely being the problem. That being said either are possible.

P022C Charge Air Cooler Bypass Control A Circuit High code is set when the ECM detects a higher than desired electrical value.

What Are The Symptoms Of The P022C Code?

Symptoms of a P022C engine code may include:

- Poor engine performance
- Vehicle entering “limp mode”
- Engine misfiring
- Poor fuel mileage

What Are The Potential Causes Of The P022C Code?

Causes for this code may include:

- Stuck open/closed bypass valve
- Obstruction in bypass valve’s operational range of motion
- Broken or damaged wiring harness
- Fuse/relay defective
- ECM issue
- Pin/connector problem. (e.g. corrosion, broken lock tab, etc.)

How Can You Fix The P022C Code?

Be sure to check for technical service bulletins (TSBs) for your vehicle. Getting access to a known fix can save you time and money during diagnosis.

Tools

When working within the forced induction system you may need:

- OBD code reader
- Hose clamp pliers
- Lubricant
- Multimeter
- Basic socket set
- Basic ratchet and wrench sets
- Basic screwdriver set
- Rag/shop towels
- Battery terminal cleaner
- Service manual

Safety Tips

- Let engine cool

- Chalk wheels
- Wear PPE (Personal protective equipment)

NOTE: ALWAYS verify and record the integrity of your battery and charging system before further troubleshooting.

Basic Step #1

Locate your charge air cooler bypass control valve by following the charge piping going to your intercooler (IC), it may be mounted directly to charge pipe.

Depending heavily on your particular make and model, you may find your IC mounted in your front bumper, front fenders or possibly directly under the hood among many other possible locations. Once valve is located, inspect for any obvious physical damage.

NOTE: Make sure engine is off.

Basic Step #2

It may be fairly simple to remove the valve completely from the vehicle to verify it's functionality. Especially recommended if code P024B is active. Once removed, inspect for any obstructions in the valve's range of motion. If possible, clean valve before reinstalling.

NOTE: Always refer to service manual first because this may not be possible or recommended for that matter on your vehicle.

Basic Tip #3

The harness for the bypass valve may be routed through areas that are exposed to the elements. These areas should be inspected closely for nicks, cuts, signs of corrosion, etc. in the wires involved within the circuit.

NOTE: Make sure to disconnect battery before performing any electrical repairs.

Basic Step #4

Depending on your scan tool, you may be able to verify the valve's functionality by controlling it and observing it's range of motion. If accessible you could disconnect one end of valve to gain sight of the moving parts.

Using your scan tool, open valve completely and close while observing the mechanical operation of the valve itself. If you notice the valve sticking and there is nothing obstructing it, more than likely, the valve is defective. In this case, you can try replacing it. Make sure the manufacturer also recommends a new valve in this case. Refer to manual.

Basic Step #5

You will want to rule out any electrical problem within the harness involved. To do this, you may have to disconnect it at the valve and the ECM. Using your multimeter, verify the integrity of the circuit by performing numerous basic electrical tests (i.e. Continuity).

If everything checks out, there may be some input tests you could do involving testing the connector at the valve to verify the ECM functionality with the valve.

Severity Description

Severity in this case would be moderate. You don't want to leave this issue unattended as it could develop into something much more serious fairly quickly. Keep in mind, problems don't get better over time unless rectified.

Engine damage is expensive, almost every time so if you've exhausted your abilities, bring vehicle to a reputable repair facility.

Reference Sources

P022C: Charge Air Cooler Bypass Control A Circuit High, OBD-Codes.