

Supercharger Intercooler Relay Diagnosis

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Circuit Description

The supercharger intercooler relay is a normally open relay. The relay armature is held in the open position by spring tension. The ignition 1 voltage is supplied directly to the relay coil and to the armature contact when the ignition is ON, or the engine is running. The engine control module (ECM) supplies the ground path to the relay coil control circuit via an internal integrated circuit called an output driver module. When the engine is running, the ECM commands the relay ON, and the relay coil creates an electromagnetic field. This electromagnetic field overcomes the spring tension and pulls the armature contact into the stationary contact of the relay load circuit. The closing of the relay contacts allow current to flow from the battery to the supercharger intercooler pump. When the ignition switch is turned to the OFF position, power is interrupted to the output driver module in the ECM and the relay electromagnetic field collapses. This allows the spring tension to separate the relay armature contact from the relay load circuit contact, which interrupts current flow to the supercharger intercooler pump.

Diagnostic Aids

When disconnecting electrical connectors or removing fuses and relays from a fuse block, inspect the component electrical terminals for corrosion and the mating electrical terminals for correct tension.

Reference Information

Schematic Reference

[Engine Controls Schematics](#)

Connector End View Reference

[Component Connector End Views](#)

Description and Operation

- [Supercharger Description and Operation](#)
- [Boost Control System Description](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

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- [Electrical Center Identification Views](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Special Tools

J 43244 Relay Puller Pliers

[Circuit/System Verification](#)

1. Verify that DTC P023A is not set.
 - ⇒ If the DTC is set, refer to [DTC P023A](#) for further diagnosis.
2. Ignition ON, command the CAC Clnt. Pump Relay ON and OFF several times with a scan tool. You should hear and feel the relay click with each command and the charge air cooler coolant pump should turn ON and OFF in response to the commands.

[Circuit/System Testing](#)

1. Ignition OFF, disconnect the charge air cooler coolant pump relay.
2. Ignition ON, verify that a test lamp illuminates between the switch side B+ circuit terminal 30 and ground.
 - ⇒ If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal and the B+ circuit fuse is open, test the control circuit for a short to ground. If the circuit tests normal, test or replace the relay.
3. Ignition OFF, disconnect the harness connector at the charge air cooler coolant pump.
4. Ignition OFF and all vehicle systems OFF. It may take up to 2 minutes for all vehicle systems to power down. Test for less than 2 Ω between the charge air cooler coolant pump ground circuit terminal 1 or A and ground.
 - ⇒ If greater than the specified range, test the ground circuit for an open/high resistance.
5. Connect the harness connector at the charge air cooler coolant pump.
6. Ignition ON, connect a 30 A fused jumper wire between the charge air cooler coolant pump relay switch side B+ circuit terminal 30 and the relay control circuit terminal 87. Verify that the charge air cooler coolant pump is activated.
 - ⇒ If the charge air cooler coolant pump does not activate, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the charge air cooler coolant pump
7. If all circuits test normal, test or replace the charge air cooler coolant pump relay.

[Component Testing](#)

Coolant Pump Relay

1. Ignition OFF, disconnect the charge air cooler coolant pump relay.
2. Test for 70–95 Ω between terminals 85 and 86.
 - ⇒ If the resistance is not within the specified range, replace the relay.
3. Test for infinite resistance between the following terminals:
 - 30 and 86
 - 30 and 87

- 30 and 85
- 85 and 87

⇒ If not the specified value, replace the relay.

4. Install a 10 A fused jumper wire between relay terminal 85 and 12 V. Install a jumper wire between relay terminal 86 and ground. Test for less than 2 Ω between terminals 30 and 87.

⇒ If greater than the specified range, replace the relay.

Charge Air Cooler Coolant Pump Dynamic Test

1. Ignition OFF, disconnect the harness connector at the charge air cooler coolant pump.
2. Install a 30 A fused jumper wire between the B+ terminal 2 or B and 12 V.
3. Install a jumper wire between the ground terminal 1 or A and ground. The charge air cooler coolant pump should activate.

⇒ If the charge air cooler coolant pump does not activate, replace the pump.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Relay Replacement](#)
- [Charge Air Cooler Coolant Pump Replacement](#)