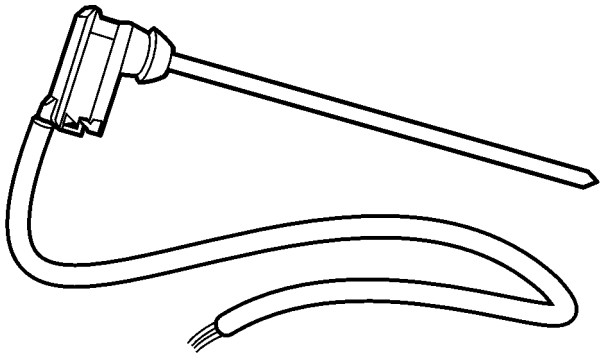
VOLVO
Volvo Trucks North America, Inc.
Greensboro, NC USA

Service Bulletin Trucks

Date	Group	No.	Page
3.2002	**871**	**002**	1(11)

Climate Control System
Electronic Cold Control Sensor
VN, VHD

Electronic Cold Control Sensor



W8003036

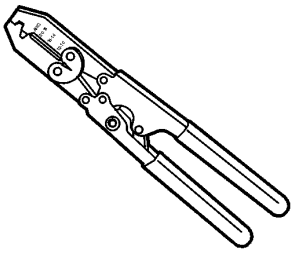
Effective from build date: May 2001

In May 2001 a modification was made to the “Cold Control” or thermostatic switch in the climate control system. From that date, the switch changed from an electrical switch to an electronically controlled sensor and module.

Tools

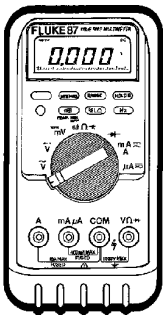
Special Tools

For ordering information, see the Special Tools information in group 08.



W0002051

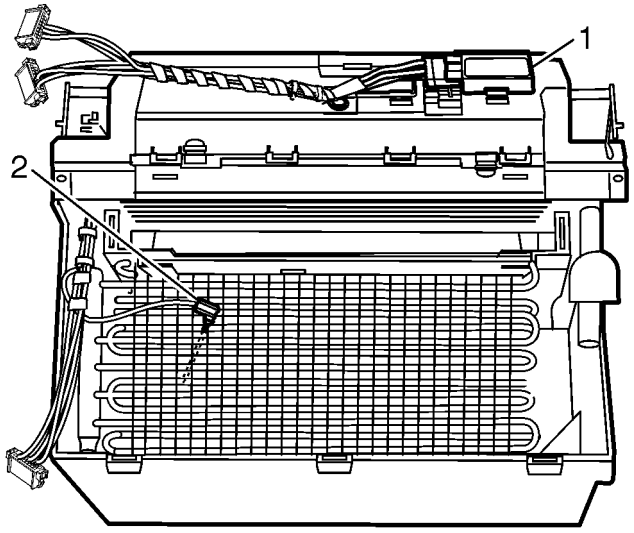
J-38125-8
Wire Crimpers



W0002007

J-39200
Digital Multimeter (DMM)

Electronic Cold Control Sensor



W8003029

As a product improvement, in May 2001, an electronic cold control (thermostatic) sensor and module were introduced to replace the mechanical cold control switch and relay.

In the older mechanical cold control switch and relay, a capillary tube inserted into the evaporator core sensed the core temperature to open and close a mechanical switch. The switch in turn controlled the operation of a mechanical relay to send a “compressor on” request to the APADS module. For more detailed information on the mechanical cold control switch and relay see “Climate Control, VN/VHD” in group 87.

In the new electronic cold control sensor and module, a sensor (2) inserted into the evaporator core changes resistance with core temperatures. The module (1) processes the resistance value to send a “compressor on” request to the APADS module to maintain the proper evaporator core temperature.

Troubleshooting

Electronic Cold Control Sensor Troubleshooting

If a problem is present in the A/C system follow the troubleshooting procedures found in the "Climate Control" information in group 87 to determine if the probable cause is the cold control switch. Remember that the troubleshooting information in the Climate Control section is written based on the earlier mechanical cold control switch and relay. The troubleshooting procedures after the "compressor on" request is delivered to the APADS module is the same for both the earlier mechanical cold control switch and relay and the later electronic cold control sensor and module. The troubleshooting information presented in this bulletin only concerns the electronic cold control sensor and module and their ability to deliver the "compressor on" request.

The cold control module should deliver a "compressor on" request to the APADS module when the evaporator core temperature is not cold enough to provide sufficient cooling to the cab air. If it is determined that a "compressor on" request is not being received at the APADS module (Pin H) the most likely problems are:

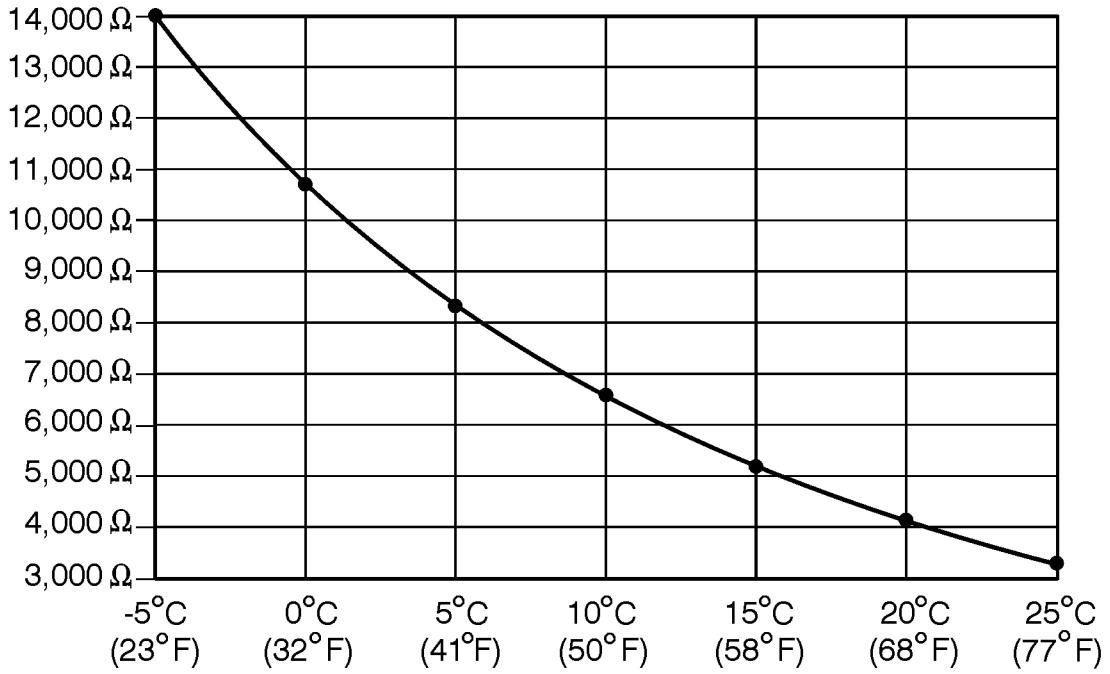
- Fault in the Cold Control Module
- Fault in the Cold Control Sensor
- Wiring

Use the Simplified Schematic and DMM to check the values per the chart below observing the following points:

- For detailed, vehicle specific schematics see "VN/VHD Electrical Schematics" found in group 37.
- Back probe connectors when possible to avoid pin or socket damage.
- Remove sensor from core to insure probe temperature is warm enough to request A/C compressor operation.

Function	**Key Position**	**Measuring Point**	**Expected Value**	**If Expected Value Not Correct Check:**
Ground Circuit (Ω)	Off	Pin 6 - Ground	<1Ω	Ground circuit wiring fault.
Sensor Resistance Check (Ω)	Off	Pin 1 - 5	See “Sensor Resistance Chart” page 5.	Wiring fault to sensor or faulty sensor.
Power Circuit (VDC measurement)	On, with A/C Switch On	Pin 3 - Ground	12V	Power circuit wiring fault or blown fuse.
A/C On Request From Dash (VDC measurement)	On, with A/C Switch On	Pin 4 - Ground	12V	Wiring / switch faults from control panel in dash or blown fuse.
A/C Compressor On Request To APADS (VDC measurement)	On, with A/C Switch On	Pin 2 - Ground	12V	If all other checks on this chart OK, probable module fault.

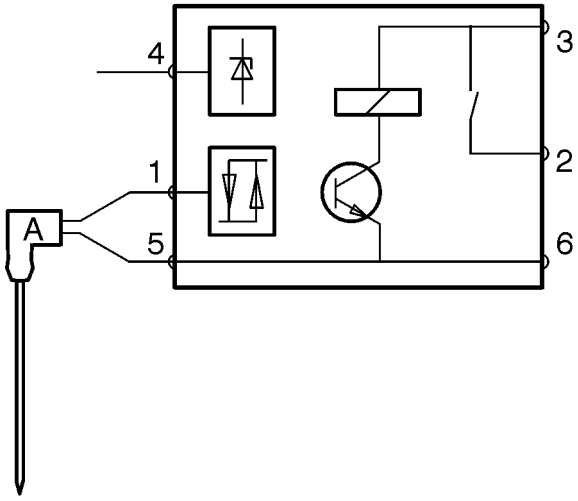
Sensor Resistance Chart



W8003033

Simplified Schematic

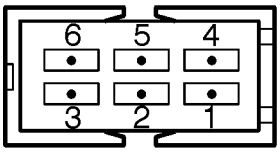
This schematic should be used to clarify the troubleshooting procedures in this bulletin. For detailed, vehicle-specific fault tracing, see VN or VHD Electrical Schematics in Group 37.



W8003034

Simplified Schematic
A: Sensor

1 Sensor Supply
2 A/C Compressor On Request to APADS
3 + 12V Supply to Module
4 A/C On Request from Dash
5 Sensor Ground
6 Ground



W8003035

Module Connector Pinout

8712-03-02-07 Cold Control Sensor, Replacement

1

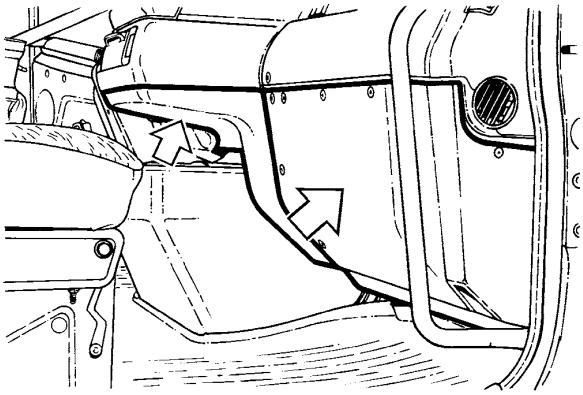
DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Make sure the vehicle ignition is OFF.

2
Remove the right upper grab handle mounting bolt, and tilt the handle out.

3

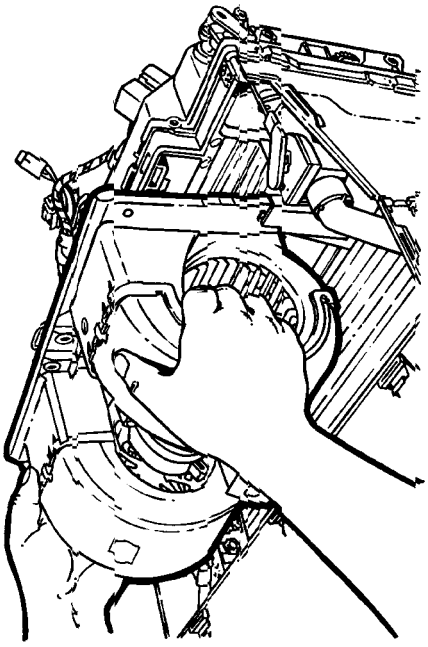


W8001131

Remove the center and right lower dash panels.

4
On the climate control unit, unclip the nine clips from the front cover, then remove the cover.

5



W8001238

Slide the blower assembly out of the climate control unit housing. If the plastic tray comes out with the blower, install the tray back into the climate control unit.

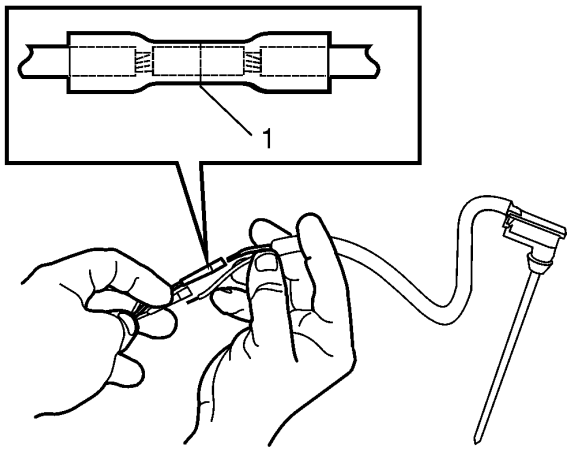
6
Pull the cold control sensor out of the evaporator core. Note the angle at which it is removed.

7
If the replacement cold control sensor is equipped with any terminal end except a butt connector with heat-shrink sealant, cut the terminal ends off.

8
Using the replacement cold control sensor wiring as a guide, cut the wiring to the faulty cold control sensor, being careful to maintain the original length. If necessary, remove approximately 5 cm (2 in) of cable jacket to expose the wires.

9
Strip approximately 6 mm (0.25 in) of insulation from each wire end. Use caution not to cut the wire strands.

10

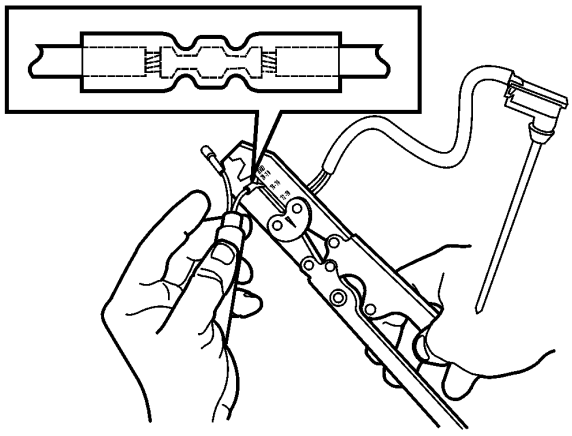


W8003025

1 Wire stop

Observe polarity when connecting the wires. Use a heat-shrinkable wiring connector to splice the wires together. Insert each end of the wire into the connector until it hits the wire stop.

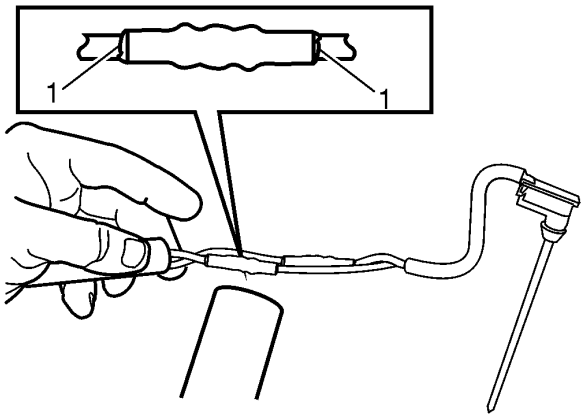
11



W8003026

Insert the connector into the proper anvil on the crimping tool and crimp. Gently tug on the spliced connection to be sure the wire is secure.

12



W8003027

1 Visible Sealant

Use a heat gun to activate the heat shrink. Look for sealant at each end of the connector as evidence of a good application. Note: do not use an open flame to apply heat shrink.

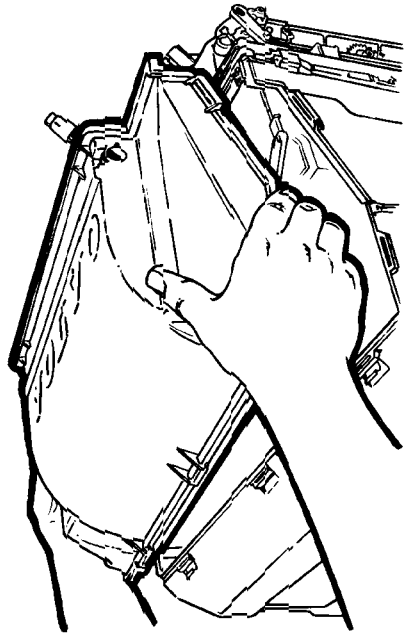
13

Insert the cold control sensor into the evaporator core at the angle from which it was removed.

14

Slide the blower assembly into the climate control unit.

15

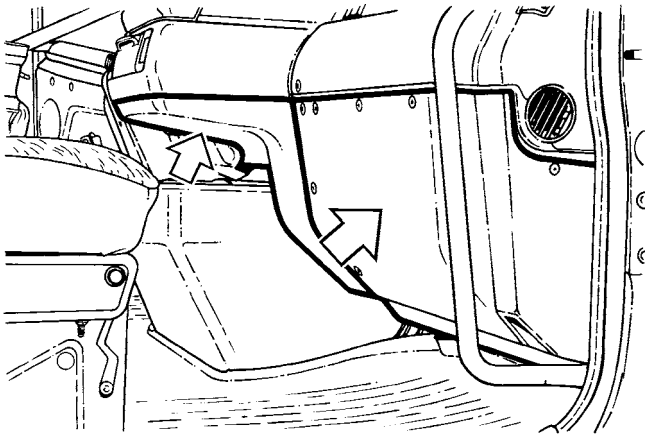


W8001237

Reinstall the front cover on the climate control unit. Ensure there are no air gaps, then install the metal retainer clips.

NOTE: The cover should be pushed up into the channel to make certain it is properly seated.

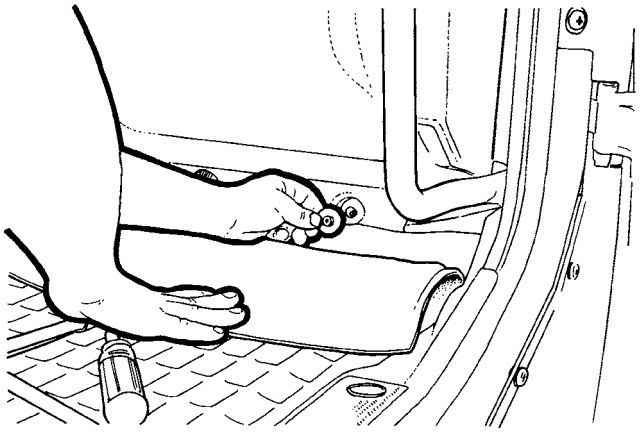
16



W8001131

Install the center under-dash panel using four mounting screws. Install the lower right dash panel using seven torx screws.

17



W8001166

Pull the floor mat back and install the plastic nuts in the lower right dash panel and in the panel under the center of the dash.

18

Install the right side upper grab handle bolt.

8712-03-02-08 Cold Control Module, Replacement

1

DANGER

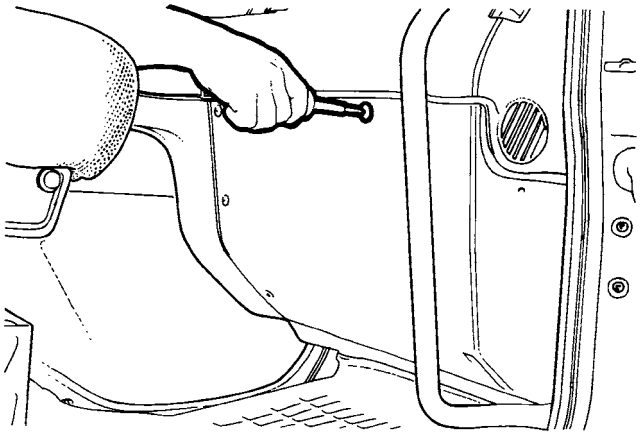
Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Make sure the vehicle ignition is OFF.

2

Remove the right upper grab handle mounting bolt, and tilt the handle out.

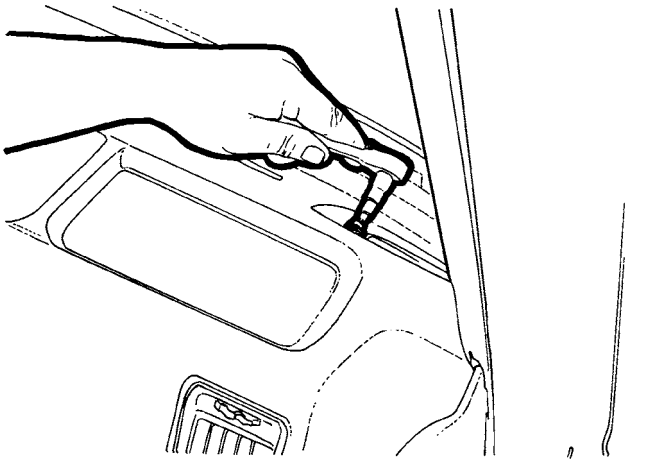
3



W8001167

Remove the screws that secure the right side upper and lower dash together.

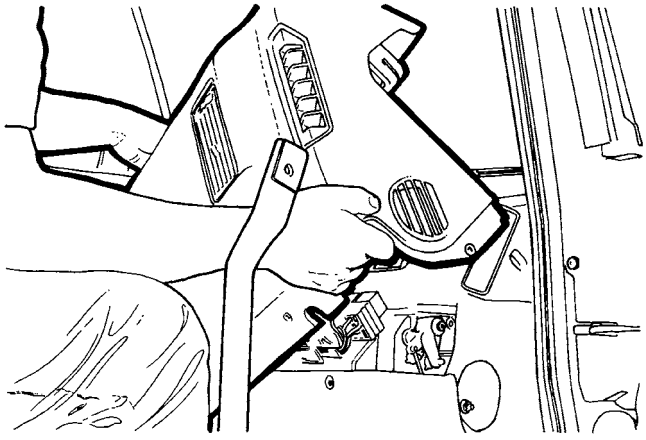
4



W8001178

Remove the right dash speaker cover and speaker.

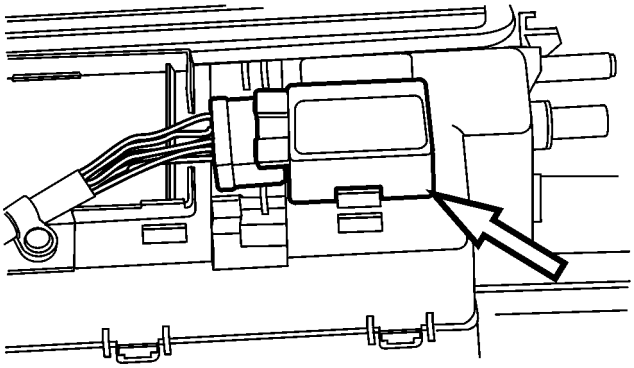
5



W8001180

Remove the right side upper dash.

6



W8003028

Cold control module

Remove the fastener that secures the cold control module. Disconnect the wiring harness fastener and remove the module.

7
Connect the connector to the replacement cold control module and secure with the mounting fastener.

8
Install the right side upper dash.

9
Install the right dash speaker and cover.

10
Install the screws that secure the right side upper and lower dash together.

11
Install the right side upper grab handle bolt.