

## Actuator Description

The automatic climate control system (C68) uses the following five actuators in order to adjust the temperature and the air distribution:

- The electric actuator or the temperature actuator controls the temperature valve.
- The air inlet actuator controls the air inlet valve.
- The slave actuator controls the heater slave valve.
- The mode actuator controls the mode valve.
- The defroster actuator controls the defroster valve.

When servicing an actuator, replace parts with the correct service parts for the actuator being serviced. The electric actuator for the automatic climate control system (C68) has a green R on the top in order to differentiate the electric actuator from the electric actuator used on the manual climate control systems (C42, C60).

The electric actuator contains a feedback potentiometer. The feedback potentiometer reports the position of the electric actuator to the electronic climate control (ECC) module (Control Assembly). Do not test the electric actuator for movement while disconnected from the heater/vent module with the temperature knob on the control assembly. If the electric actuator is removed or replaced for service the actuator must be initialized. Refer to *Temperature Actuator Replacement* for the initialization procedure.

The air inlet actuator and the slave actuator are vacuum motors with one vacuum port in order to move the attached valves in one direction.

The mode actuator and the defroster actuator are vacuum motors with two vacuum ports in order to move the attached valves in two directions.

## HVAC Compressor Controls Circuit Description

The compressor for the air conditioning (A/C) system is driven by the engine through the following components:

- The belt drive
- The A/C compressor clutch.

The A/C compressor will engage if the following conditions are met:

- The A/C switch is not OFF.
- The outside temperature is above 6°C (43°F).
- The refrigerant pressure is normal.
- The engine speed does not exceed 5985 RPM.
- The engine speed does not exceed 5325 RPM when A/C is previously requested OFF.

The electronic climate control (ECC) module serves as an interface between the passenger and the A/C system. System voltage is supplied to the ECC module by the following sources:

- Continuous battery voltage source:
  - RDO BATT fuse 19
  - CKT 340 (ORN).

- Interrupted battery voltage source:
  - Ignition switch
  - HVAC I fuse 21
  - CKT 341 (BRN)

The ground path is provided by CKT 1050 (BLK) to grounds G203/G204.

The A/C request signal is generated by the ECC module. The ECC module may produce the A/C request signal in two modes:

- Automatic operation
- Manual operation

The A/C request signal produced by the ECC module has the following route:

1. CKT 203 (LT BLU) to the A/C compressor high pressure cutoff switch
2. The A/C compressor high pressure cutoff switch to CKT 762 (DK GRN/WHT) to the VCM

Along with the request signal, the VCM will monitor the system for high and low pressure conditions.

The A/C System pressure data to the VCM is provided by the following components:

- A/C compressor cycling switch and CKT 603 (DK GRN) for low pressure
- A/C compressor high pressure cutoff switch and CKT 762 (DK GRN/WHT) for high pressure

The VCM supplies the ground path for the A/C compressor clutch relay coil and CKT 459 (DK GRN/WHT). Voltage is provided by the IGN-E fuse. With the relay energized the contacts will close and complete the current path for the A/C compressor clutch.

The current path is provided by the following components:

- The A/C fuse
- The A/C compressor clutch relay
- CKT 59 (DK GRN)
- The A/C compressor clutch
- CKT 350 (BLK)

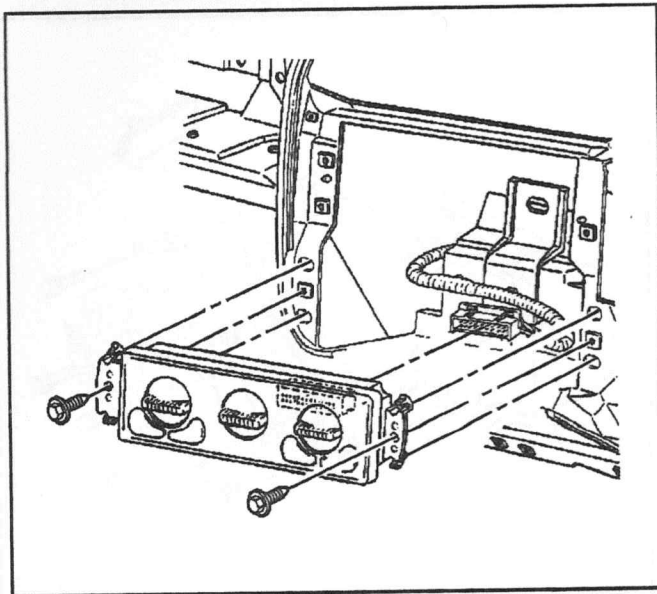
The A/C compressor clutch diode is connected across the A/C compressor clutch coil for circuit protection.

## HVAC Blower Controls Circuit Description

The electronic climate control (ECC) module serves as an interface between the passenger and the blower motor. System voltage is supplied to the ECC module by the following sources:

- Continuous battery voltage source:
  - RDO BATT fuse 19
  - CKT 340 (ORN).
- Interrupted battery voltage source:
  - Ignition switch
  - HVAC I fuse 21
  - CKT 341 (BRN)

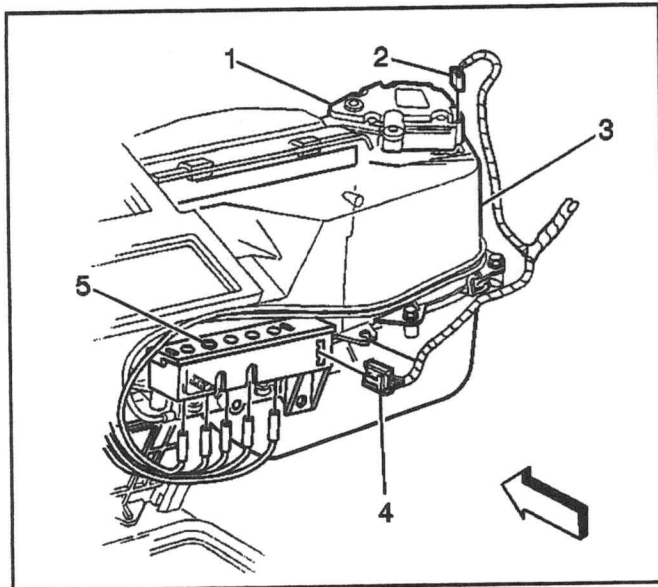
The ground path is provided by CKT 1050 (BLK) to grounds G203/G204.



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### Installation Procedure

1. Install the control assembly bulb to the control assembly.
2. Connect the electrical connectors to the control assembly.
3. Install the control assembly into the instrument panel, ensuring that the control assembly retaining tabs lock into place.
4. Install the control assembly retaining screws.
5. Install the instrument panel accessory trim plate. Refer to *Trim Plate Replacement - IP Accessory* in Instrument Panel, Gauges and Console.



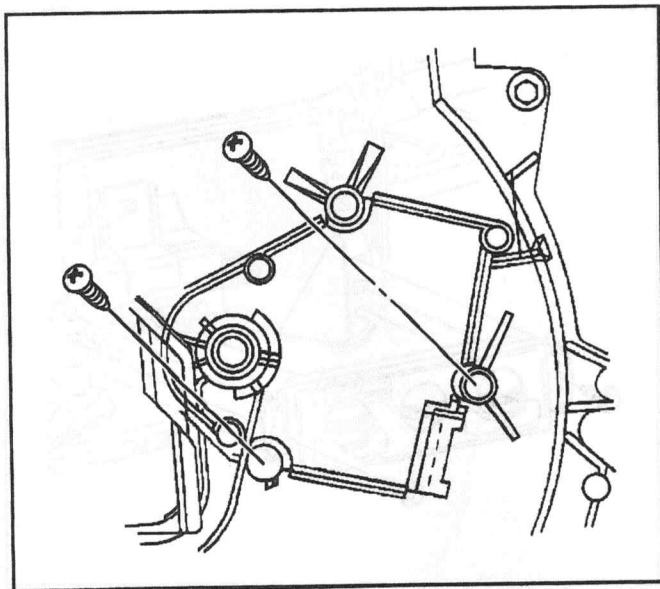
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### Temperature Actuator Replacement

#### Removal Procedure

The electric actuator (temperature) is located on the top right hand side of the heater/vent module.

1. Remove the instrument panel carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges, and Console.
2. Disconnect the electrical connector.

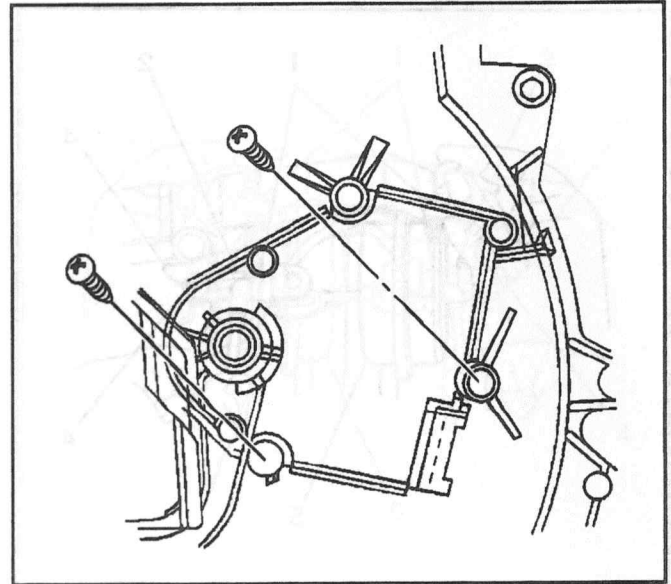


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3. Remove the electric actuator retaining screws.
4. Remove the electric actuator from the heater/vent module.

### Installation Procedure

1. Install the electric actuator to the heater/vent module. Ensure that the actuator is seated on the locating tab.



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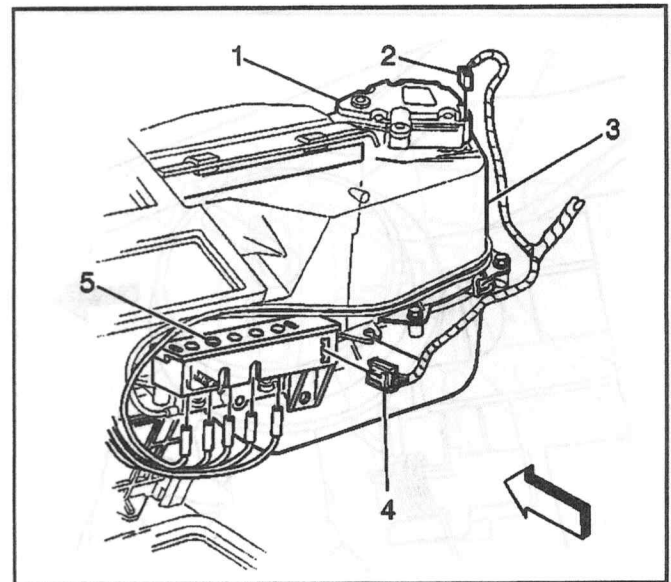
**Notice:** Refer to *Fastener Notice* in Cautions and Notices.

2. Install the electric actuator retaining screws.

#### Tighten

Tighten to 1.9 N·m (17 lb ft).

3. Connect the electrical connector.
4. Install the instrument panel carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges, and Console.
5. Perform the following procedure in order to Initialize the electric actuator on vehicles equipped with automatic climate control (C68).
  - 5.1. Turn the ignition switch to the OFF position.
  - 5.2. Remove the RDO BATT fuse for 10 seconds.
  - 5.3. Reinstall the RDO BATT fuse.
  - 5.4. Turn the ignition switch to the ON position.
  - 5.5. Ensure that the electric actuator cycles through the hot and cold range.
6. Perform a heater output temperature check. Refer to *Heater Output Temperature Check*.



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