

HVAC

– How the Circuit Works

Climate Control

The climate control unit controls the blower controls, air delivery, and A/C compressor controls either automatically or semi-automatically. The control unit receives battery voltage at all times through fuse 18 (in the under-dash fuse/relay box). With the ignition switch in ACC (I) or ON (II), battery voltage is supplied through fuse 16 (in the under-dash fuse/relay box). The control unit is grounded at G404.

Fully-automatic Operation

To put the automatic climate control in automatic mode, press the AUTO button and set the fan control dial to AUTO, then set the desired temperature by turning the temperature control dial. You will see AUTO in the system's display.

The system automatically selects the proper mix of cooled and/or heated air that will, as soon as engine coolant temperature allows, raise or lower the interior temperature from its current level to the set temperature. The system also adjusts the fan speed and changes direction of air delivery as needed to maintain the set temperature.

When you set the temperature to its lower limit (60°F/15.5°C) or its upper limit (90°F/32°C), the system runs at full cooling or heating only. It does not regulate the interior temperature. When the temperature is set between the lower and upper limits, the system regulates the interior temperature to the set value.

Semi-automatic Operation

You can manually select various functions of the climate control system when it is in AUTO. All other features remain automatically controlled. Making a manual selection causes the word AUTO to go off.

However, when you select A/C OFF, the system cannot regulate the inside temperature if you set the dial lower than the temperature outside.

Blower Controls

The blower speed is automatically controlled in the automatic mode. You can manually select it by repeatedly pressing the blower speed button. The more times you press it, the faster the fan goes until it reaches maximum speed.

Battery voltage is applied through fuse 12 (in the under-hood fuse/relay box) to the blower motor relay contacts at all times. With the ignition switch in ACC (I) or ON (II), the blower motor relay in the under-hood fuse/relay box is energized which feeds battery voltage to the blower motor. The blower power transistor controls the blower motor in all speeds except HIGH. The blower power transistor is controlled by the climate control unit. When the control unit requests HIGH blower speed, it grounds the blower motor HIGH relay coil, energizing the relay, which connects the blower motor directly to ground, making the blower run at high speed.

In cold weather, the blower will not come on automatically until the heater starts to develop warm air.

Air Delivery

The climate control unit controls the blower motor and supplies a 5V DC reference voltage to the air mixture control motor.

The air mix and mode control motors each receive inputs from the control unit. The air mix motor regulates the mixture of cold and hot air by varying the position of the heater-evaporator door. The mode control motor controls the direction and volume of outlet air. Use the MODE button to select which vents the air flows from. Some air will flow from the dashboard corner vents in all modes. Each time you press the MODE button, the display shows the mode selected. Press the button four times to see all the modes. Both the air mix control motor and mode control motor are grounded by the control unit.

The recirculation control motor receives battery voltage through fuse 16 when the ignition switch is in ACC (I) or ON (II). It regulates the position of the fresh/recirc door, and is controlled by two position inputs from the control unit ("Recirc" and "Fresh").



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A/C Compressor Controls

Voltage is provided at all times to the A/C compressor clutch relay contacts through fuse 19 (in the under-hood fuse/relay box). With the ignition switch in ACC (I) or ON (II), voltage is supplied to the relay coil through fuse 16 (in the under-dash fuse/relay box).

With the ignition switch in ACC (I) or ON (II), the climate control unit grounds the A/C ON input of the ECM through the A/C pressure switch. The ECM then grounds the A/C compressor clutch relay coil. This energizes the coil, which closes the relay contacts and provides voltage through fuse 19 (in the under-hood fuse/relay box) to the compressor clutch. The clutch then engages and begins turning the compressor. Whenever the climate control system is on, the A/C is on.

Evaporator Temperature Sensor

The evaporator temperature sensor is located on the evaporator housing. If the temperature at the evaporator gets too cold, the evaporator temperature sensor sends a signal to the climate control unit to turn off the compressor clutch. This prevents condensation from freezing on the evaporator fins and blocking air delivery into the passenger compartment.

A/C Pressure Switch

The A/C pressure switch is located in the condenser outlet line where refrigerant is in a high temperature/high pressure liquid state. The switch will sense abnormally high or low pressure, and open the circuit. This removes ground from the ECM, and turns off the compressor.

Refer to the Service Manual (Section 21, HVAC) for specific tests or troubleshooting procedures.