

Control Components

Manual A/C

The manual climate control system heats or cools the vehicle interior depending on the function selector position and the temperature selected. The function selector position determines heating or cooling and air distribution. The temperature blend control setting determines air temperature.

The manual climate control components are used to:

- select air inlet source (outside or recirculated).
- select blower motor speed.
- select discharge air temperature (temperature blend).
- select discharge air location (defrost, panel, floor).
- select A/C compressor clutch operation.

Electronic Automatic Temperature Control

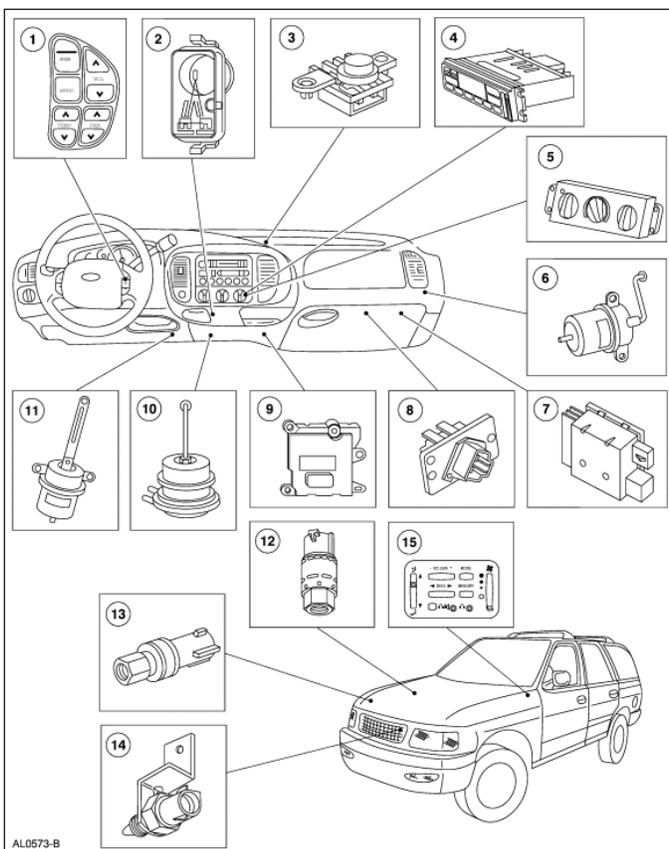
With the use of a microcontroller, the electronic automatic temperature control (EATC) module analyzes input from the following major sources:

- temperature, function and blower selection (made by the vehicle occupants)
- in-vehicle temperature
- ambient temperature
- sunload
- vehicle speed
- engine coolant temperature

Using these inputs, the microcontroller determines the correct conditions for the following outputs:

- A/C compressor clutch engagement
- blower speed
- air temperature blend door position
- panel/floor door position
- panel/defrost door position
- air inlet duct door position
- outside temperature display

Component Locations



AL0573-B

Item	Part Number	Description
1	—	Steering wheel remote control switch Assy (EATC only)
2	19D888	Automatic temperature control sensor hose and elbow— (EATC only)
3	19E663	A/C sunload sensor— (EATC only)
4	19980	Electronic automatic temperature control module
5	19980	Manual A/C control assembly
6	18A318	Air inlet door vacuum control motor
7	19E624	A/C blower motor speed control— (EATC Only)
8	18591	Heater blower motor switch resistor— (Manual A/C only)
9	19E616	A/C electronic door actuator motor
10	18A318	Panel/floor door vacuum control motor
11	18A318	Panel/defrost door vacuum control motor
12	19E561	A/C cycling switch
13	19D594	A/C pressure cut-off switch
14	19E702	A/C ambient air temperature sensor and bracket— (EATC only)
15	—	Rear integrated control panel (not available with aux. A/C.)

Floor Console Blower

The floor console blower provides airflow to the rear seat passengers. Controls for the console blower are incorporated into the rear integrated control panel located in the rear of the floor center console. The controls adjust the console blower speed and the direction of airflow. The floor console blower is not available with auxiliary air conditioning. Removal and installation of the rear integrated control panel is covered in [Section 415-01](#).

Control System Inputs—Manual A/C

Climate Control Assembly

The climate control assembly has three system controls:

- The A/C heater function selector switch combines a vacuum selector valve with two electrical switches to supply battery positive voltage (B+) to the A/C clutch circuit and the blower motor control circuit.
- The temperature selection is accomplished with a potentiometer connected to the electric blend door actuator that controls positioning of the temperature blend door. Movement of the control knob from COOL (blue) to WARM (red) causes a corresponding movement on the air temperature control door and determines the temperature that the system will maintain.
- The blower motor switch controls blower motor speed by adding or bypassing resistors in the heater blower motor switch resistor.

Control System Inputs—EATC

Climate Control Assembly

The electronic automatic temperature control (EATC) module, located in the instrument panel, has the following features:

- 11 push buttons
- a blower speed override thumbwheel for manual input
- a vacuum fluorescent display for displaying set temperature, ambient temperature, function and diagnostic trouble codes (DTCs)
- an on-board diagnostic (OBD) feature to supply the technician with diagnostic trouble codes (DTCs). These DTCs direct the technician to the inoperative component.

A/C Ambient Air Temperature Sensor

The A/C ambient air temperature sensor and bracket:

- is located in front of the A/C condenser core near the center of the vehicle.
- contains a thermistor which measures the temperature of outside air as a resistance and sends that reading to the EATC module.

In-Car Temperature Sensor

The in-car temperature sensor operates in the following manner:

- A thermistor in the in-car temperature sensor measures air temperature inside the passenger compartment.
- An automatic temperature control sensor hose and elbow is connected between the plenum assembly and the in-car temperature sensor.
- The automatic temperature control sensor hose and elbow uses air from the plenum assembly air stream to create a suction at the in-car temperature sensor.
- The suction draws in-vehicle air into the in-car temperature sensor and across the thermistor.

A/C Sunload Sensor

The A/C sunload sensor:

- is located on the top of the instrument panel.
- contains a photovoltaic diode that is sensitive to light.
- has some unspecified resistance across the terminals depending upon the amount of light reaching the photovoltaic diode; therefore the only test that can be performed is for an internal short circuit.

Control System Outputs—Manual A/C

Blower Motor Switch Resistor

The heater blower motor switch resistor has the following features:

- The assembly is located on the passenger side of the plenum assembly behind the glove compartment.
- Three resistance elements are mounted on the resistor board to provide four A/C blower motor speeds.
- Depending on the heater blower motor switch position, series resistance is added or bypassed in the A/C blower motor circuit to decrease or increase A/C blower motor speed.
- An overheating protective device (thermal limiter) will open the resistor coil circuit when the temperature reaches 121 °C (250 °F) interrupting the blower motor operation in all speeds except HI.
- The thermal limiter cannot be reset and is not serviceable.

Control System Outputs—EATC

A/C Blower Motor Speed Control

The A/C blower motor speed control is a pulse width modulated (PWM) type which provides variable blower speed control of the blower motor. The A/C blower motor speed control is controlled by switching the control signal voltage of 5 volts OFF and ON 2,000 times per second. By varying the ratio of time on (+5 volts) to time off (0 volts), the EATC module tells the A/C blower motor speed control how fast the blower motor should run. The A/C blower motor speed control has the following features:

- Has circuitry to protect the blower motor from burning out in the event of a locked rotor condition.
- Can compensate for changes in battery positive voltage (B+) which prevents the blower speed from slowing down when the engine is idling and will provide up to a maximum of 30 amperes for blower motor operation with battery voltages between 10 and 16 volts.

A/C Electric Blend Door Actuator

The A/C electric blend door actuator is located on the plenum assembly.

- Its function is to move the air temperature blend door on command from the control assembly.
- The A/C electric blend door actuator contains a reversible electric motor and a potentiometer. The potentiometer wiper is connected to the actuator output shaft and moves with the output shaft to indicate the position of the air temperature blend door.
- A 5 volt signal is applied to the ends of the potentiometer. The voltage available at the wiper indicates the position of the potentiometer. The expressed value of the actuator wiper voltage is sent to the EATC module and is compared to the desired wiper voltage determined by the EATC module. The control module then drives the actuator motor in whichever direction is necessary to make the actuator wiper voltage agree with the desired wiper voltage.

EATC SYSTEM RESPONSE

Control Assembly Selection	Air Temperature Blend Door Response	Panel/Floor Door Response	Panel/Defrost Door Response	Air Inlet Door Response	Blower Motor Response (Unless Manually Overridden)	A/C Clutch Response ^a
OFF	Remains fixed	Fixed in PANEL	Fixed in DEFROST	Fixed in RECIRC	Blower Motor OFF	A/C clutch disabled
AUTO	Varies according to the sensor temperatures and the customer temperature selection. The air temperature blend door is in the heat	Air to the floor during heating when the engine coolant temp. is above 49°C (120 °F)	Air to the windshield defroster hose nozzle during heating. Air to the panel during	Recirculates air when maximum A/C is required. Otherwise outside	Variable blower motor speeds when the engine coolant temp. is above 49 °C (120 °F) or A/C is required. The blower motor is at its lowest speed	A/C clutch enabled.

	position when the sensors are cool. The air temperature blend door is in the A/C position when the sensors are hot.	^b . Air to panel during heating when the coolant temp. is below 49°C (120°F) ^b .	cooling.	air.	when the engine coolant is below 49°C (120°F) and heating is required.	
MAX A/C	Varies according to the sensor temperatures and the customer temperature selection.	Air to the panel.	Fixed in the PANEL position.	Fixed in the RECIRC position.	Variable blower motor speeds.	A/C clutch enabled.
VENT	Varies according to the sensor temperatures and the customer temperature selection.	Air to the panel.	Fixed in the PANEL position.	Fixed in the outside air position.	Variable blower motor speeds.	A/C clutch disabled.
PNL-FLR	Varies according to the sensor temperatures and the customer temperature selection.	Air to the panel and the floor.	Fixed in the PANEL position.	Fixed in the outside air position.	Variable blower motor speeds.	A/C clutch enabled.
FLOOR	Varies according to the sensor temperatures and the customer temperature selection.	Air to the floor.	Fixed in the DEFROST position.	Fixed in the outside air position.	Variable blower motor speeds.	A/C clutch disabled.
FLR-DEF	Varies according to the sensor temperatures and the customer temperature selection.	Air to the panel and the floor.	Fixed in the DEFROST position.	Fixed in the outside air position.	Variable blower motor speeds.	A/C clutch enabled.
DEFROST	Varies according to the sensor temperatures and the customer temperature selection.	Air to the panel.	Fixed in the DEFROST position.	Fixed in the outside air position.	Variable blower motor speeds.	A/C clutch enabled.

^a The EATC activates the A/C clutch via a relay, but whether or not the A/C clutch is actually ON also depends on the position of the A/C pressure cut-off switch.

^b If the engine coolant temperature fails to reach 50°C (122°F) after 3-1/2 minutes of operation, the blower motor speed will increase to the desired speed within the next minute and the panel/floor door will shift from the defrost position to the floor position.