4. Automatic Air Conditioning

A: GENERAL

When the AUTO mode is selected, the automatic air conditioner controls the air temperature and air flow rate automatically.

1. SPECIFICATIONS

Item	Specifications			Remarks
Air conditioning	"Full-air-mix" type			
Cooling performance	Cooling capacity (W)		5300	
	Air flow rate (m^3/h)		460	
Refrigerant (g)	400±30			
Compressor	Type		Scroll	Denso SCSA08C
	Capacity (cm^3/rev)		74.5	
	Maximum permissible speed (rpm)		9000	
	Lubricant (amount contained in compressor in g)		Denso oil 8 (70)	
Magnetic clutch	Type		Dry, single disc	
	Power consumption (W)		35	
	Pulley ratio		1:1.43 (crankshaft pulley diameter: 133 mm; compressor pulley diameter: 125 mm)	
	Belt		Polyurethane V-belt with four ribs (H4) or six ribs (H6)	
Condenser	Type		Multi-flow type (with built-in liquid tank for subcooling)	
	Fan	Type	Electric-motor-driven axial flow fan	
		Fan diameter	H4: 300 mm Turbo and H6: 320 mm (7+5 blades)	
		Power consumption (W)	H4: 90 × 2, H6: 160 × 2, Turbo: 120 × 2	
Evaporator	Type		Laminated	
	Expansion valve		External pressure equalizing type	
	Temperature control sensor		Thermistor	
Automatic control system	Temperature control		"Full-air-mix" system	
	Fan speed control		Automatic control: stepless Manual control: six steps	
	Air introduction selection		Manual (inside air recirculation/fresh air introduction)	
	Air outlet selection		Manual (ventilation, bi-level, heater, defroster and heater/defroster)	
Other controls	Fast idle control system		Engine control module (ECM)	
	High and low pressure limit control		Low-pressure switch: Turns off compressor at a pressure higher than 0.196 MPa High-pressure switch: Turns off compressor at a pressure higher than 3.140 MPa	
	High-speed limit control		Performed by ECM	
	Radiator and condenser fan control		Performed by ECM	
Diagnosis function	The auto A/C control module has a sensor and actuator diagnosis function.			
Other controls	Manual adjustment possible at maximum heating and maximum cooling positions			

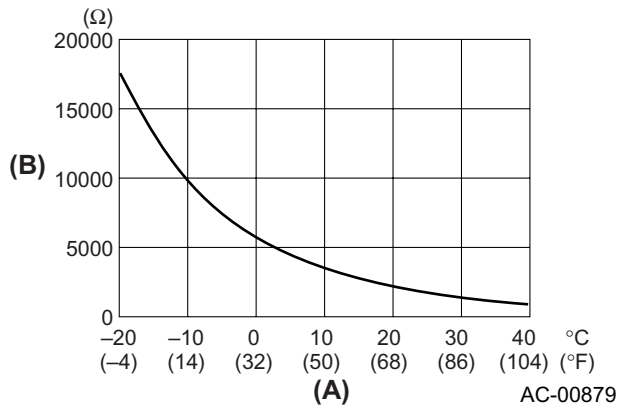
B: CONTROL PANEL

<Ref. to AC-7, MODELS WITH AUTOMATIC AIR CONDITIONING, CONTROL PANEL, Heater System.>

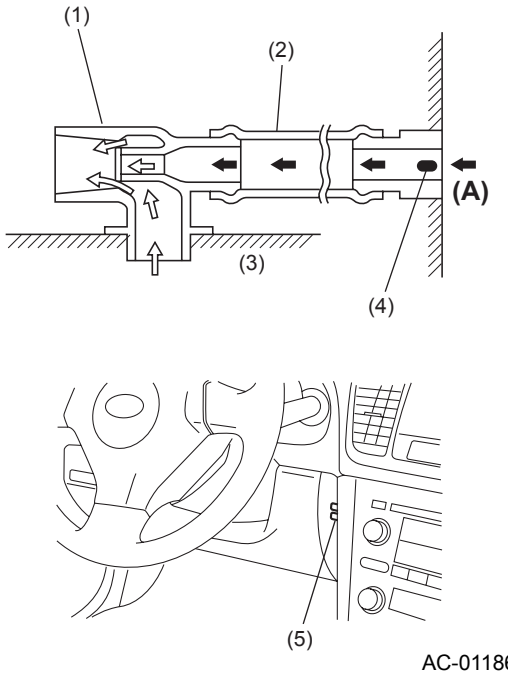
C: IN-VEHICLE SENSOR

The in-vehicle sensor detects the cabin temperature and sends an electric signal corresponding to the temperature to the A/C control module.

This sensor consists of an aspirator and a thermistor, the resistance of which changes in inverse proportion to the temperature. The aspirator operates by a vacuum generated in the heater unit (only when the blower unit is turned on).



(A) Temperature
(B) Resistance



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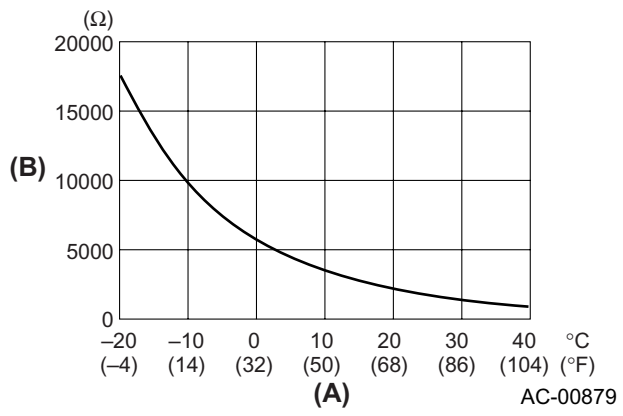
(1) Aspirator
(2) Aspirator duct
(3) Heater unit
(4) In-vehicle sensor
(5) Cabin air inlet
(A) Cabin air

D: AMBIENT SENSOR

The ambient sensor uses a thermistor to detect the ambient temperature and outputs a signal corresponding the detected temperature to the auto A/C control module.

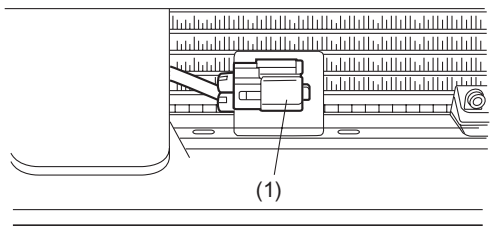
The thermistor is covered with a plastic molding to increase its thermal capacity, thus preventing it from being too sensitive to rapid changes in the temperature and enabling the sensor to output an average ambient temperature.



(A) Temperature

(B) Resistance

The ambient sensor is attached to the radiator lower panel at the portion where the radiator panel is located in such a way that it is exposed to outside air most efficiently.

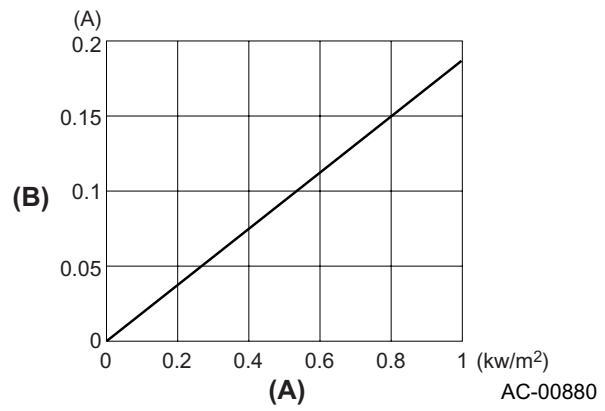


(1) Ambient sensor

E: SUN-LOAD SENSOR

The sun-load sensor uses a photodiode which can convert change in the intensity of solar radiation into change in the electric current. The output signal of the sensor is sent to the auto A/C control module.

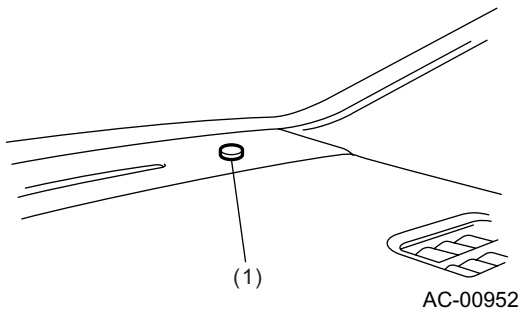
Sun-load sensor characteristic



(A) Solar radiation

(B) Photoelectric current

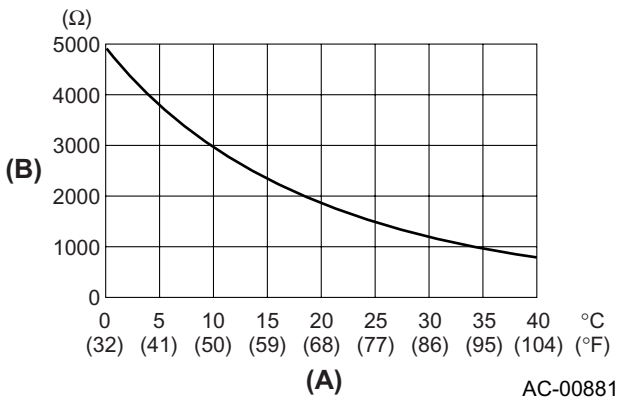
The sun-load sensor is attached to the front defroster grill.



(1) Sun-load sensor

F: EVAPORATOR SENSOR

The evaporator sensor detects the temperature of the air that has passed over the evaporator and transmits a signal corresponding to the temperature to the auto A/C control module.



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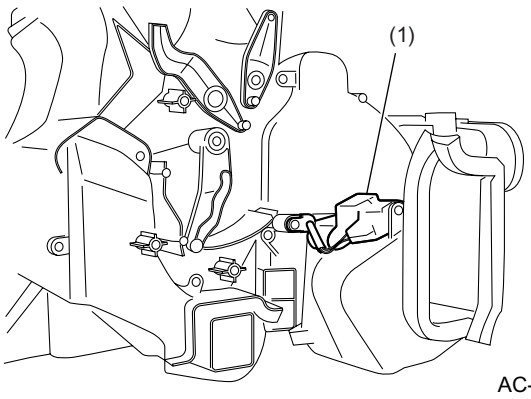
(A) Temperature

(B) Resistance



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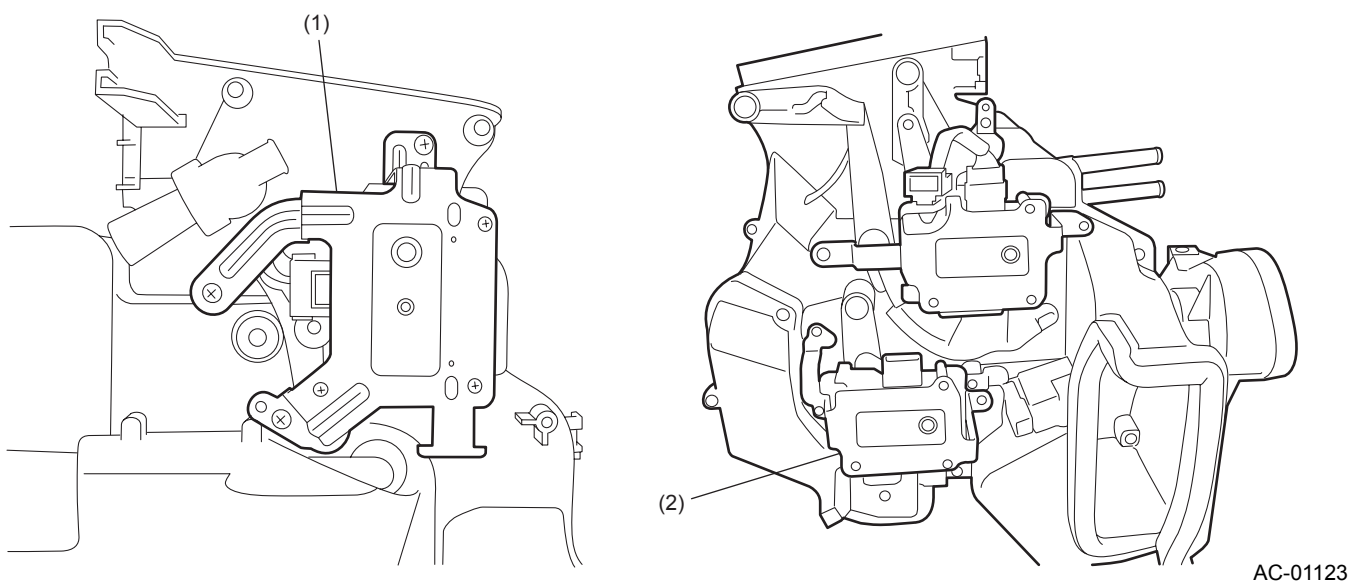
(1) Evaporator sensor connector

G: AIR MIX DOOR ACTUATOR

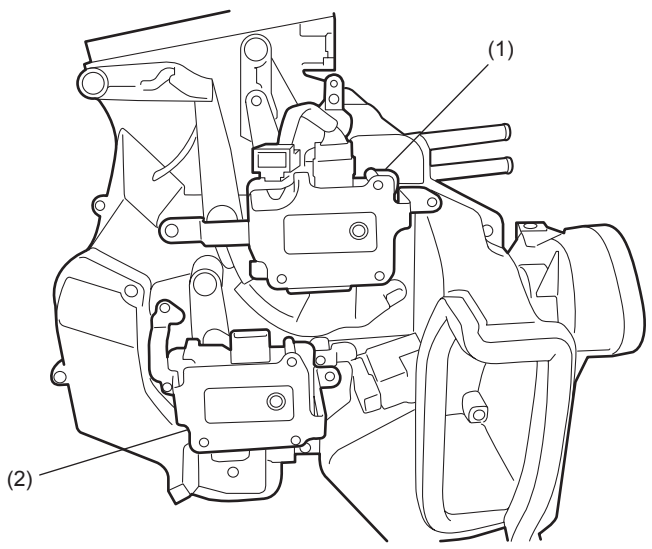
Air mix door actuators are installed at left and right of the heater and cooling unit, and they move the left and right air mix doors independently to the proper position in response to signals from the auto A/C control module. This enables the driver and passenger to control the temperature individually.



(1) Air mix door actuator (driver's seat)
(2) Air mix door actuator (passenger's seat)

H: MODE DOOR ACTUATOR

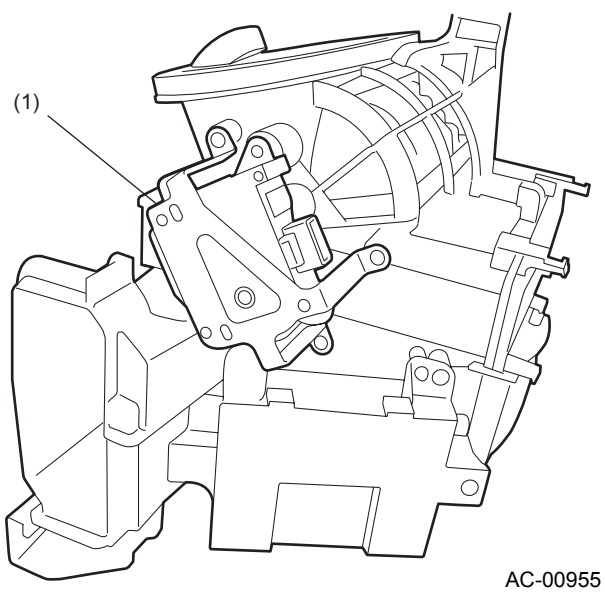
The mode door actuator incorporates an electric motor which turns in one or the other direction in response to signals from the auto A/C control module. The motion of the electric motor is transmitted to each mode door via a linkage and moves the door to the position appropriate for the selected air flow mode.



(1) Mode door actuator
(2) Air mix door actuator

I: FRESH/RECIRC DOOR ACTUATOR

The FRESH/RECIRC door actuator incorporates an electric motor which turns in one or the other direction in response to a signal from the auto A/C control module. The motion of the electric motor is transmitted to the FRESH/RECIRC door via a linkage to move the door to the outside-air introduction or cabin-air-recirculation position.



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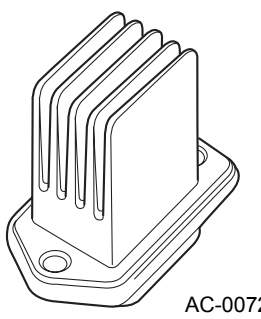
(1) FRESH/RECIRC door actuator

J: FAN CONTROL AMPLIFIER

The fan control amplifier uses a MOS* type field effect transistor. This amplifier steplessly regulates the blower motor voltage (in the range between approximately 3V and 12V) in response to gate voltage signals issued by the auto A/C control module.

Since this fan control amplifier features very small voltage drop, it can handle the maximum voltage for the maximum blower speed without need for a high-voltage relay.

*MOS = metal oxide semiconductor



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