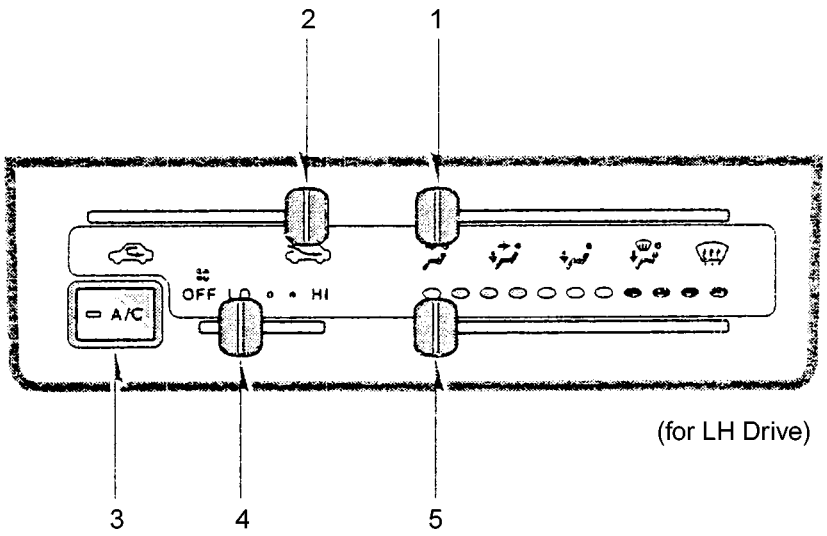
▶ Air Conditioning Specifications ◀

Item		Regular Cab	Wide Cab
Condenser	Size W × H × L mm (in.)	310 × 390 × 36 (12.3 × 15.4 × 1.4)	390 × 302.3 × 16 (15.4 × 12.0 × 0.6)
	Fin Pitch mm (in.)	3.6 (0.14)	
Evaporator	Size W × H × L mm (in.)	224 × 210 × 58 (8.8 × 8.3 × 2.3)	
	Fin Pitch mm (in.)	4.02 (0.16)	

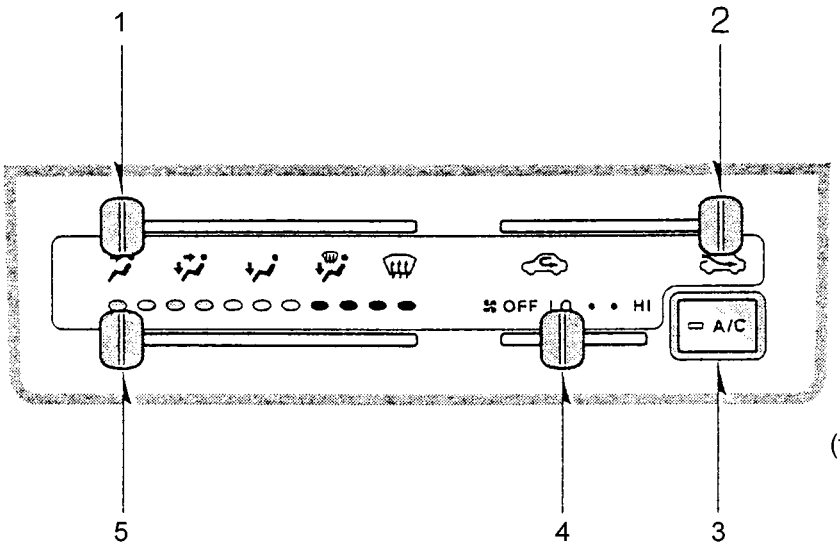
■Construction and Operation

1. Lever Type Heater Control Panel



1.Air flow selector
2.Air intake selector
3."A/C" button (on some models)
4.Fan speed selector
5.Temperature selector

(for LH Drive)

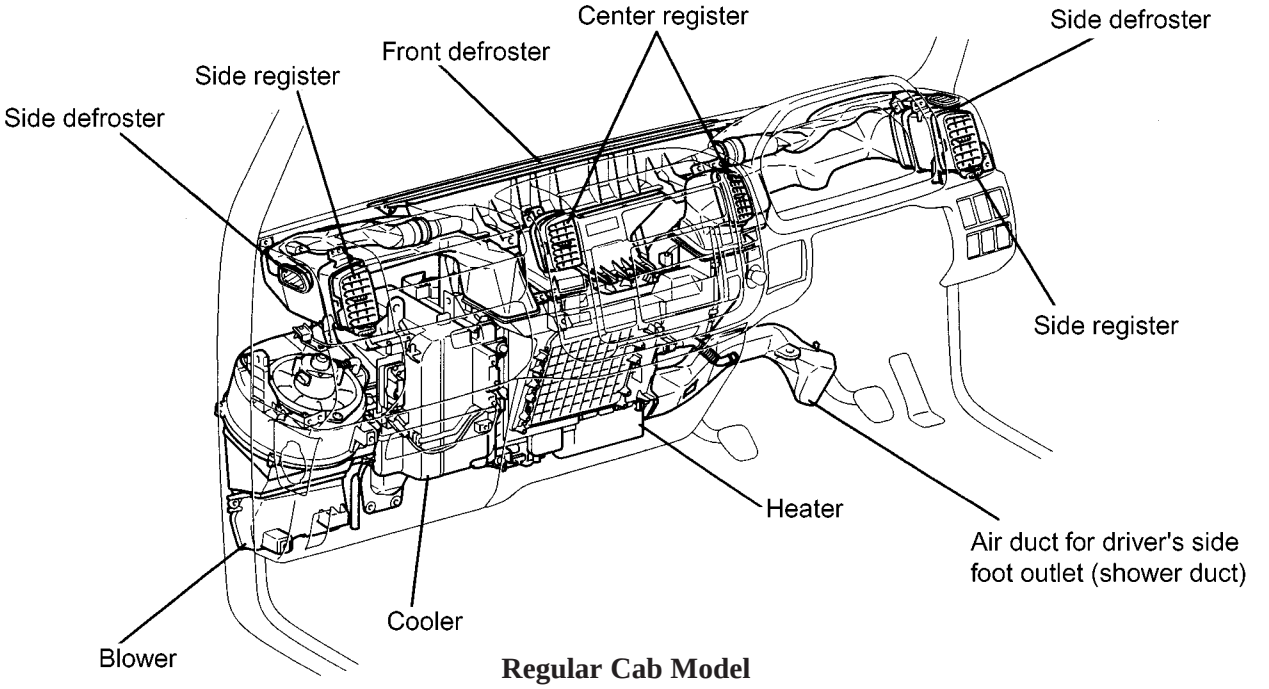


(for RH Drive)

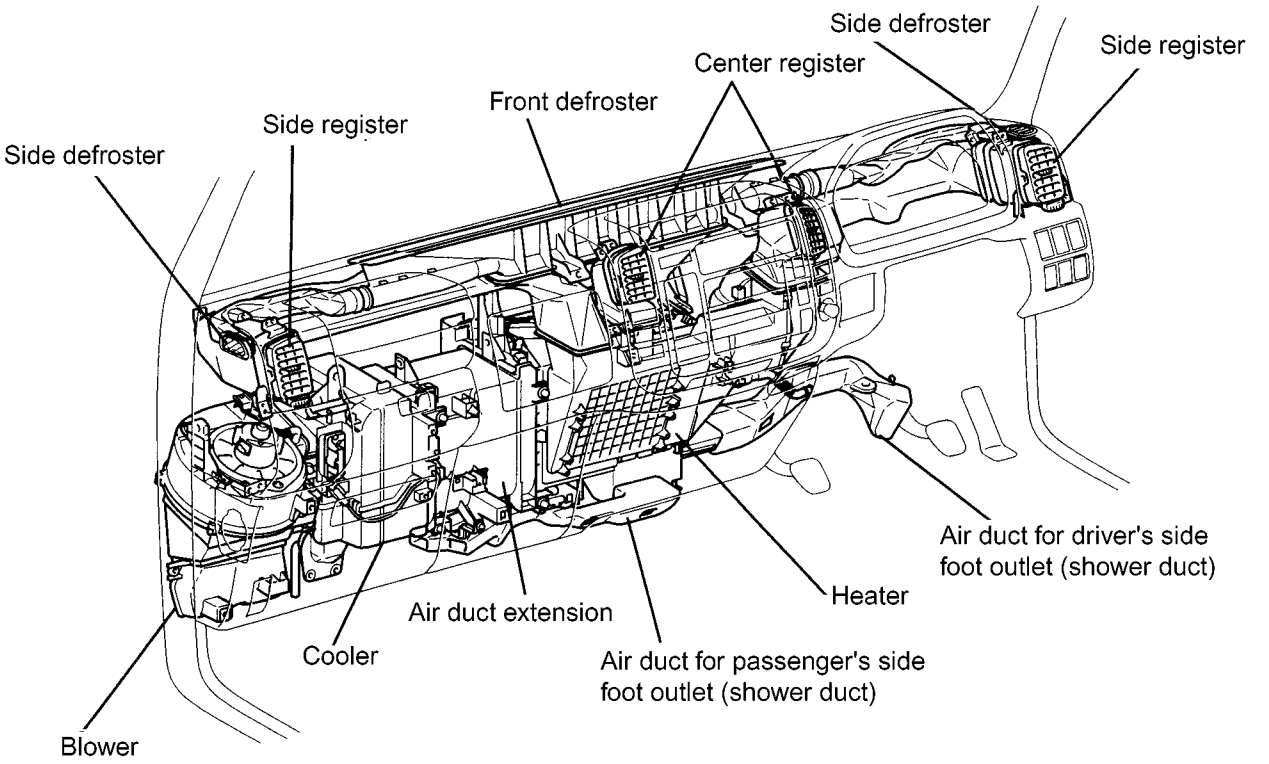
BE

2. Air Conditioning Unit Air Duct

- A full-mix type heater unit was adopted that is capable of precise temperature control by mixing warmand cold air.
- A wide-angle high-flow defroster was adopted and the front defroster nozzle was designed with aradially shaped inner wall for superior defrosting and defogging performance.
- Foot outlets with shower ducts were adopted on both the driver's and passenger's side for improved heating performance.
- Cooling performance was improved by providing a MAX COOL damper that opens fully when the heater temperature control lever is moved to the COOL setting.

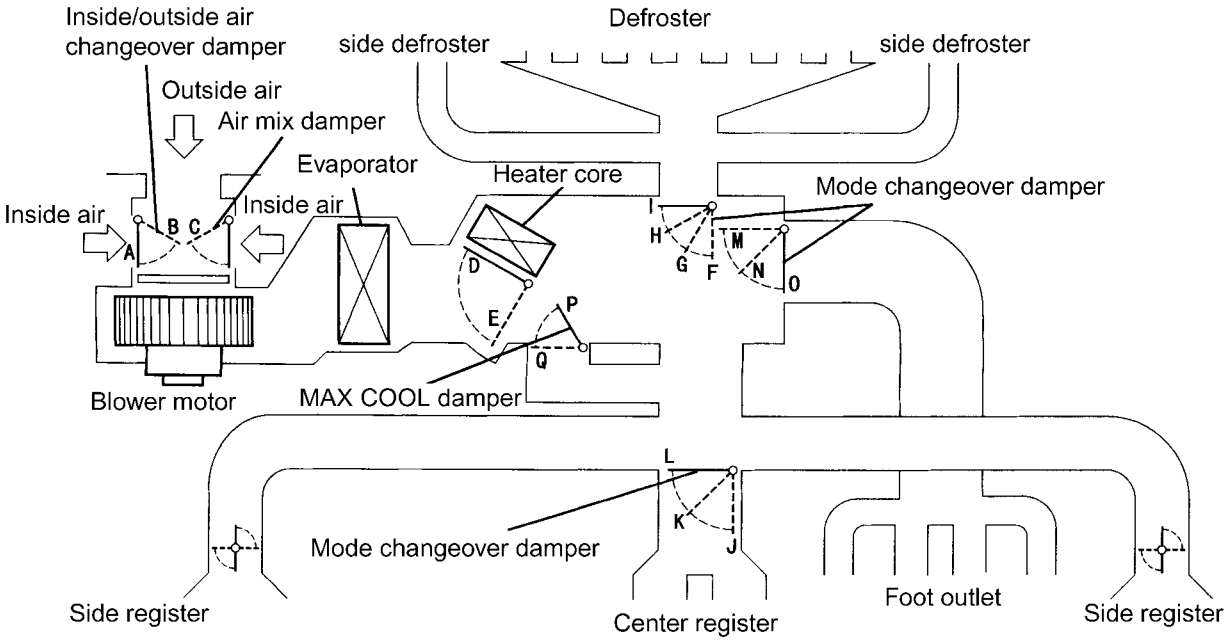


Regular Cab Model



Wide Cab Model

[1] Mode position and damper operation

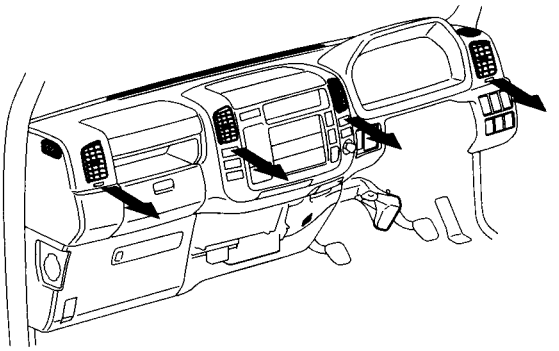


▶ Mode Position and Damper Operation ◀

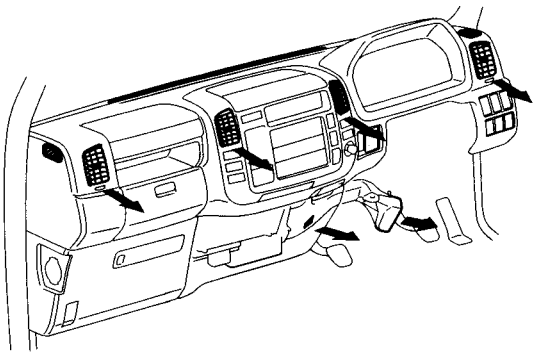
Changeover damper	Operating position	Damper position	Operation
Inside/outside air changeover damper	FRESH	A, C*1	Draws outside air into cab interior. (and partially circulates interior air)
Air mix damper	RECIRC	B, C*1	Circulates cab interior air.
Mode changeover damper	Manual type HOT~COOL	D, C	Varies the mixing ratio of warm and cold air for continuous temperature adjustment from HOT to COOL.
	FACE	I, J, Q	Directs air through side and center registers.
	BI-LABEL	I, K, N	Directs air through side and center registers and foot outlets.
	FOOT	H, L, M	Directs air mostly through side defrosters and foot outlets, with some air directed through the defroster.
	FOOT/DEF	G, L, N	Directs air through defroster and side defrosters to defog windows, and at the same time through foot outlets.
	DEF	F, L, O	Directs air through defroster and side defrosters to defog windows.
MAX COOL damper	MAX COOL	P, Q	Boosts the air flow through the side and center registers.

*1:When blower is ON

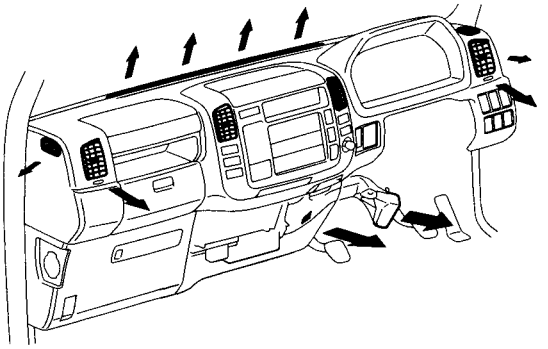
[2] Air outlets and air quantity ratio



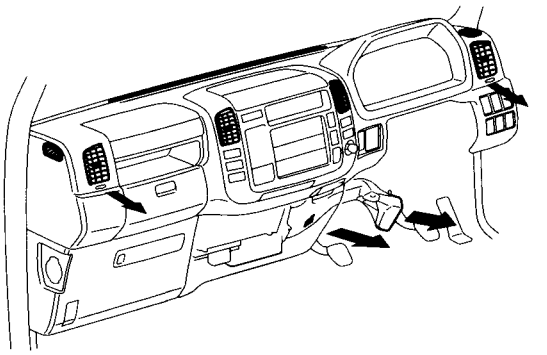
FACE mode



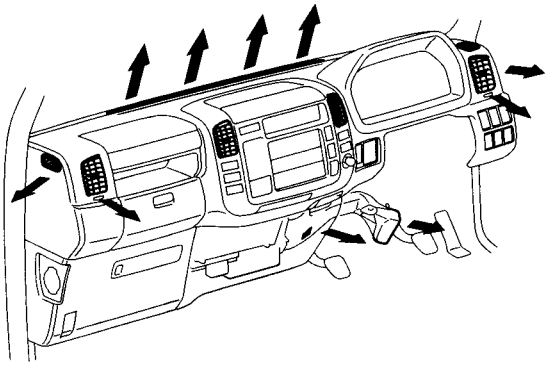
BI-LEVEL mode



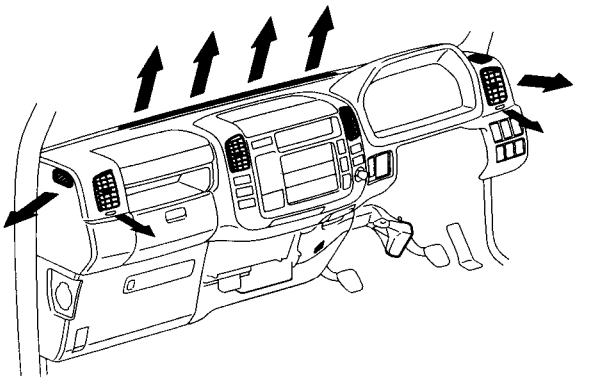
FOOT mode



FOOT mode (defrost position:0)



FOOT/DEF mode

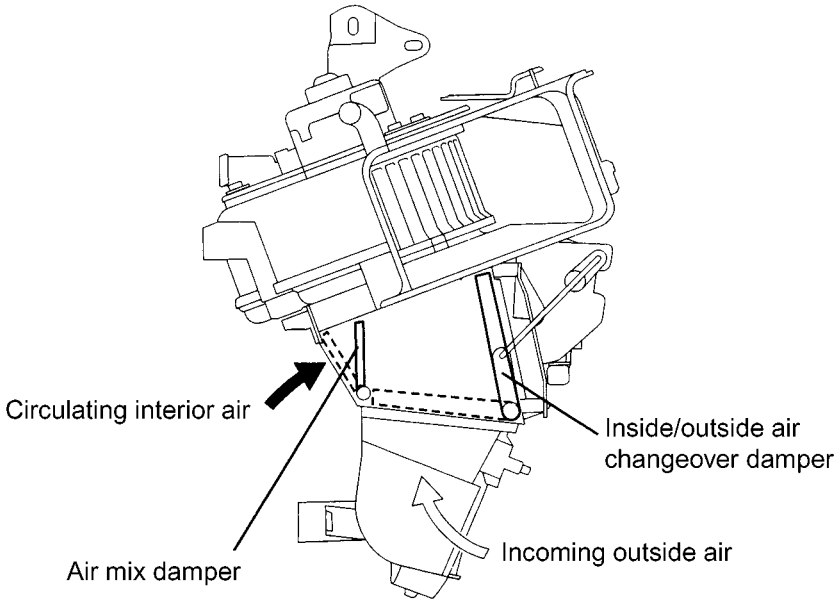


DEF mode

NOTE: The arrow size indicates air quantity. (Illustrations show a regular cab model.)

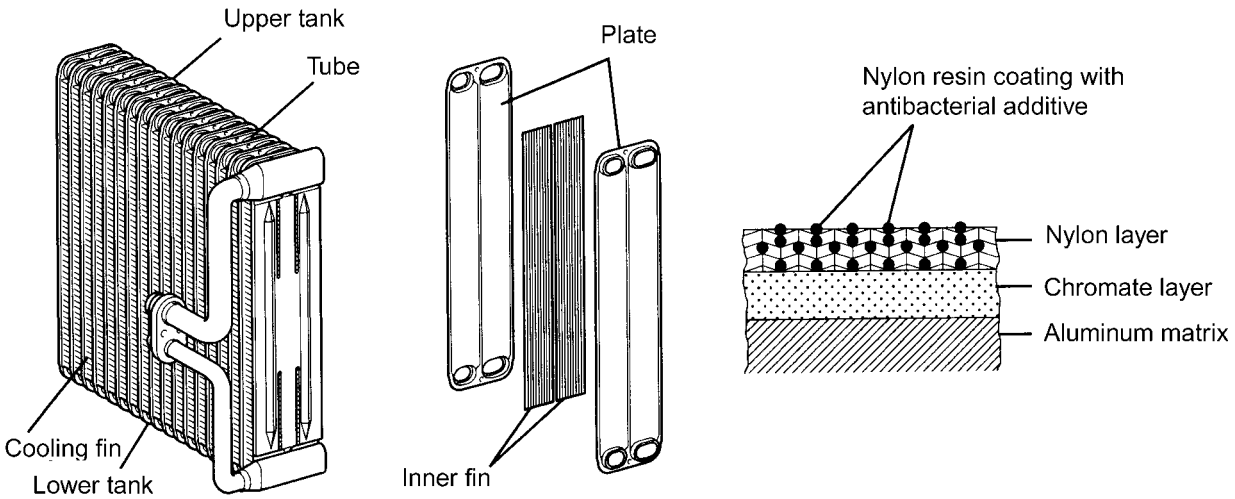
[3] Air mix damper for partial interior air circulation

To help the cab interior heat up quickly in cold weather, the blower is constructed with an air mix damper that allows partial interior air circulation even when the air inlet selection switch is set so that outside air is being drawn into the cab.

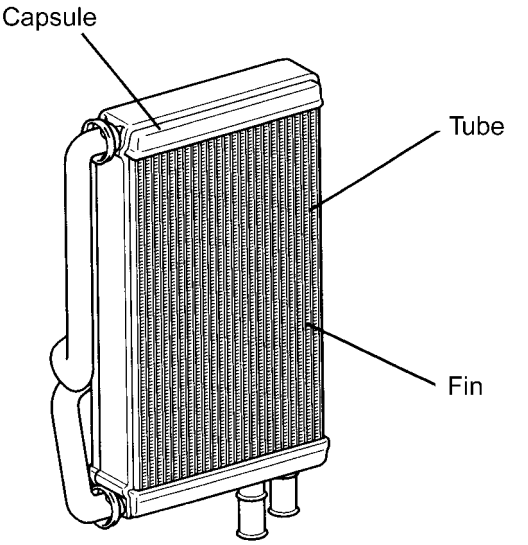


[4] Drawn cup type MS (multi tank super slim structure) evaporator

- The MS evaporator is comprised of upper and lower tanks, a tube, and cooling fins. The tube forms a micro-passage consisting of inner fins inserted between plates and joined to them by brazing. This arrangement improves the evaporator superior heat transfer characteristics and makes possible a super slim construction.
- The evaporator has a resin coating with an antibacterial additive that suppresses the growth of microorganisms, which are the cause of foul odor.

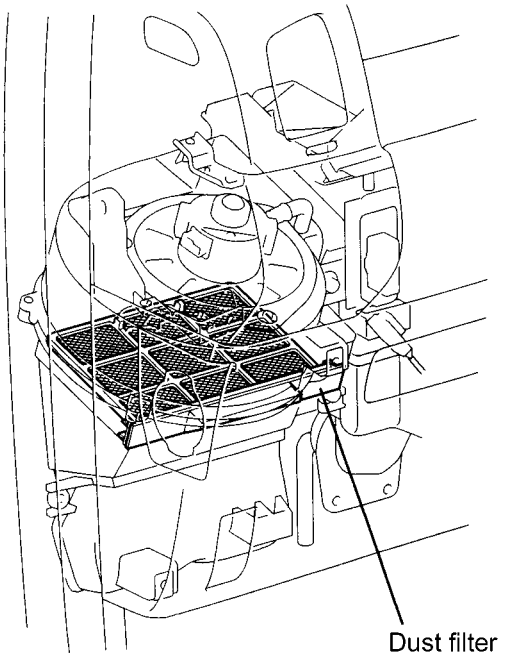


[5] SFA (straight flow aluminum) heater core



- The SFA heater core consists of a tube, fins, and a capsule. The tube heat transfer characteristics were improved by flattening the tube, which also improved heating performance and reduced the unit size and weight.
- For environmental consideration, the heater core itself was made of aluminum, which can be easily recycled.

[6] Dust filter



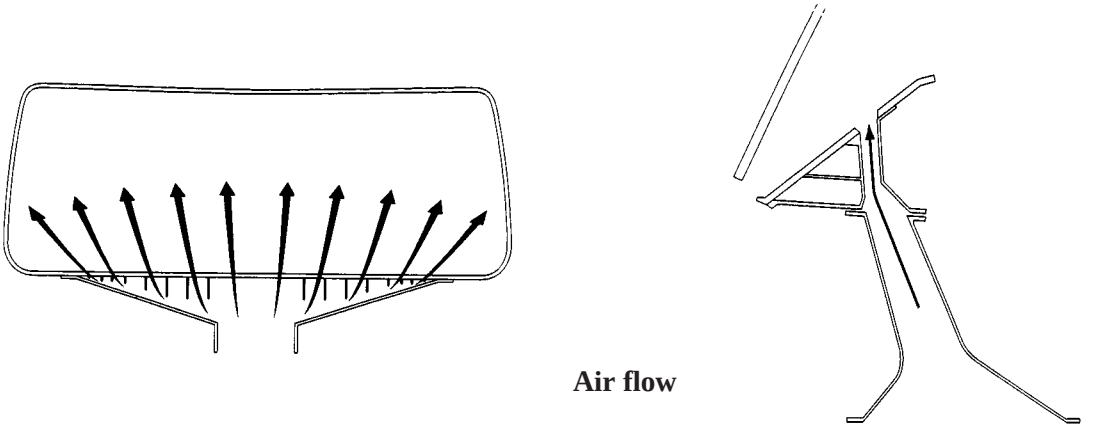
- A dust filter was provided for removal of coarse dust.
- The filter was mounted under the blower fan inside the blower case so that it can clean both the air drawn into the cab and the air circulated inside the cab.
- Filter replacement is performed by removing the instrument cluster finish panel and the windshield washer tank.

CAUTION

- Check the filter once every 2 months. Be sure to turn the blower fan off before checking the filter.
- Periodically replace the filter to maintain its dust collecting performance.

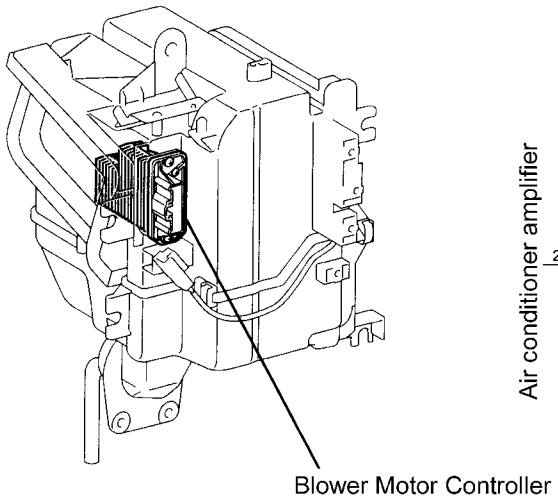
[7] Wide-angle high-flow defroster

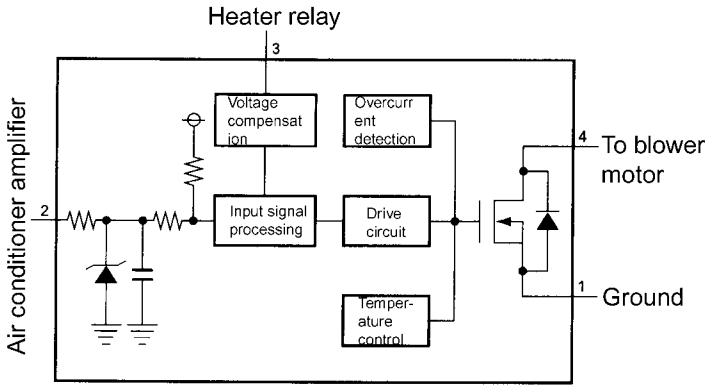
The front defroster nozzle inner wall was given a radial shape and the defroster was designed for smooth air flow for improved defrosting and defogging performance, and for reduced blower noise when the air outlet mode is set to DEF mode.



3. Blower Motor Controller

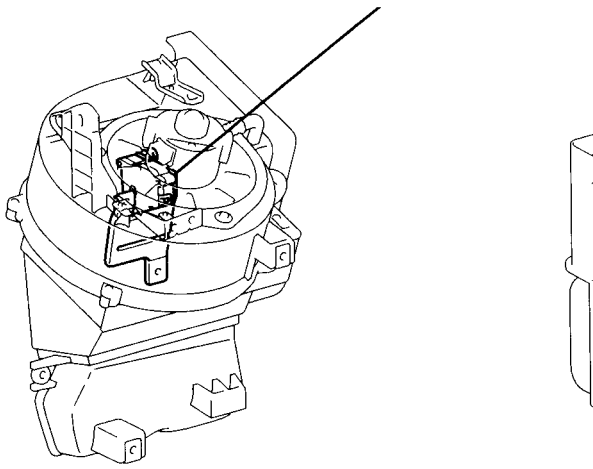
- The operating signal from the air conditioner amplifier is converted to a voltage signal by the input signal processing circuit inside the blower motor controller. The voltage signal is conducted through a drive circuit and other circuits to control the blower motor speed.
- The controller is installed on the front of the cooler.

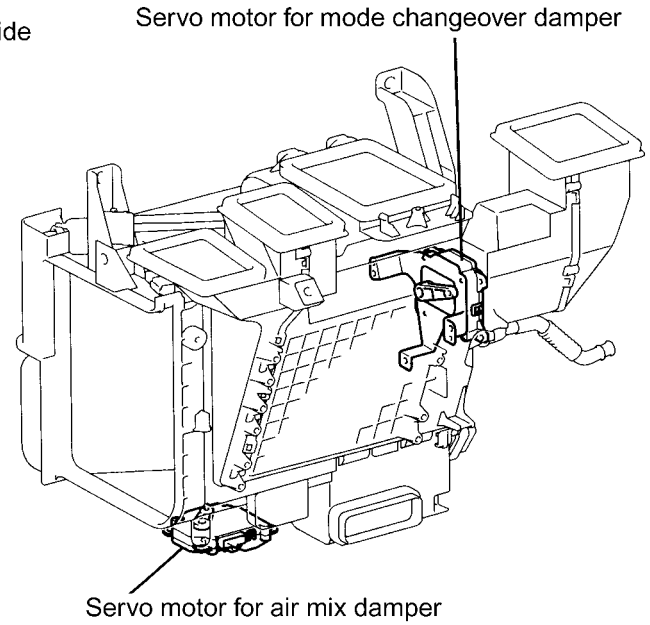




4. Servo Motor

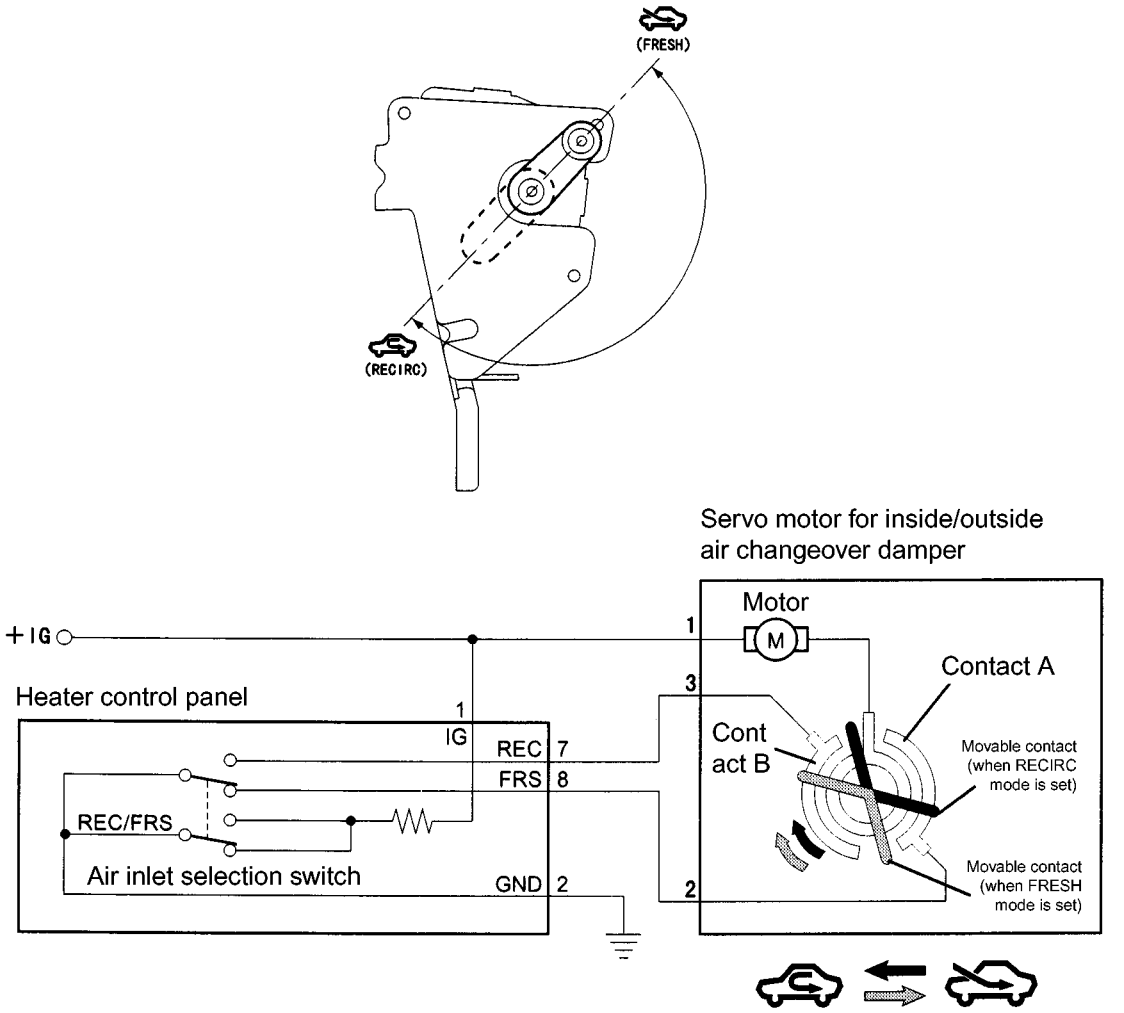
- The inside/outside air changeover damper, mode changeover damper, and air mix damper are operated by their own servo motors.
- The servo motor for the inside/outside air changeover damper is installed on the right side of the blower, the mode changeover damper servo motor on the right side of the heater, and the air mix damper servo motor on the bottom of the heater.





BE

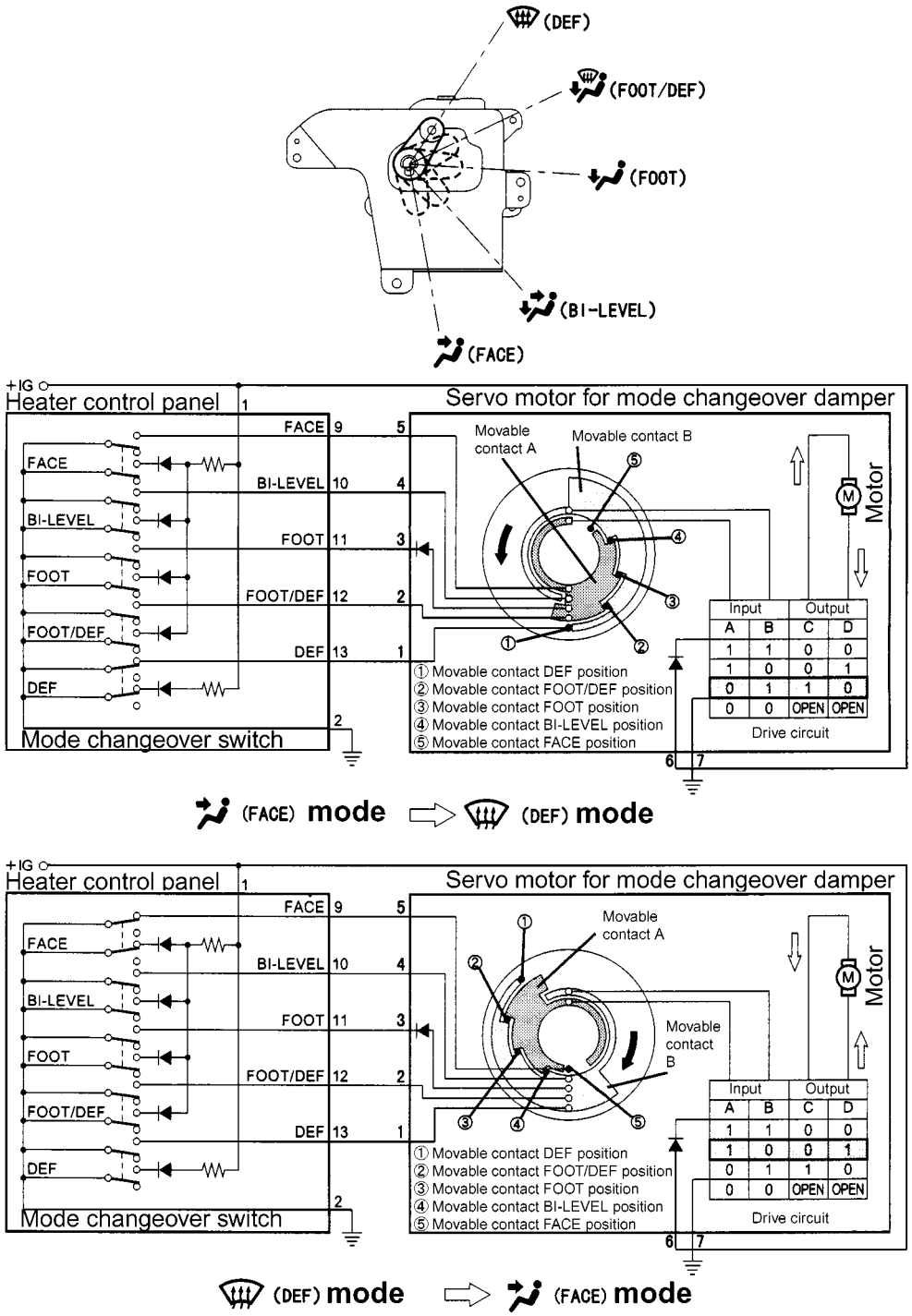
[1] Servo motor for inside/outside air changeover damper



▶ Operation ◀

Basic operation	Operating the air inlet selection switch in the heater control panel activates the servo motor that controls the inside/outside air changeover damper operation, opening or closing the damper via linkage.
Status	Changeover from RECIRC mode to FRESH mode
Flow of drive circuit current	When RECIRC mode is set and the air inlet selection switch is pressed, current flows in sequence from servo motor terminal 1 to the motor, the movable contact, contact A, servo motor terminal 2, the air inlet selection switch, and then to the ground terminal. When the movable contact separates from contact A, the motor stops.
Status	Changeover from FRESH mode to RECIRC mode
Flow of drive circuit current	When FRESH mode is set and the air inlet selection switch is turned on, current flows in sequence from servo motor terminal 1 to the motor, the movable contact, contact B, servo motor terminal 3, the air inlet selection switch, and then to the ground terminal. When the movable contact separates from contact B, the motor stops.

[2] Servo motor for mode changeover damper



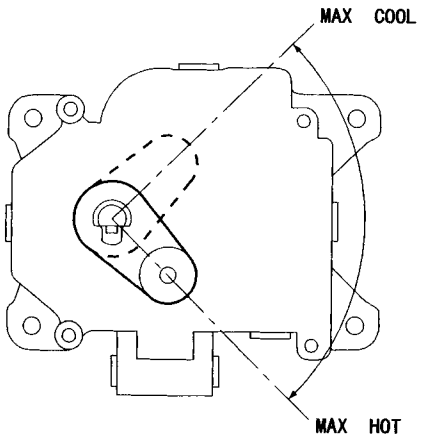
NOTE: Movable contacts represent end of operation (normal OFF position).

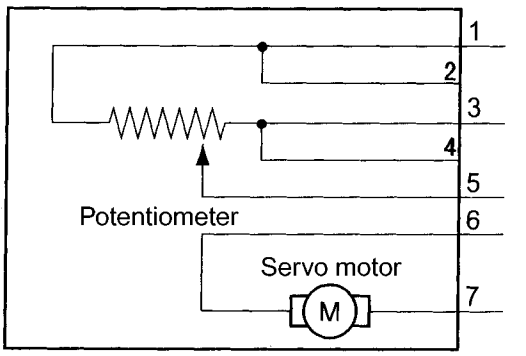
▶ Operation ◀

Basic operation	Operating one of the air outlet mode selector switches activates the drive circuit built into the servo motor and starts the motor turning (in forward or reverse), moving the damper to the selected mode position via linkage.
Status	Changeover from FACE mode to DEF mode
Flow of drive circuit current	• When FACE mode is set and the DEF mode selector switch is turned on, current flows in sequence from heater control panel terminal 13 to the DEF contact, movable contact B, and then to drive circuit B. (The servo motor drive circuit A input is "0" and drive circuit B input is "1" when open.) • When the above is input into the drive circuit, the output sequence from the drive circuit to the motor is C to motor to D, which starts the motor. This causes both movable contacts (A and B) to turn counterclockwise at the same time. When contact B separates from the DEF contact, the motor stops and DEF mode is set.
Status	Changeover from FRESH mode to RECIRC mode
Flow of drive circuit current	• When DEF mode is set and the FACE mode selector switch is turned on, current flows in sequence from heater control panel terminal 9 to the FACE contact, movable contact A, and then to drive circuit A. (The servo motor drive circuit B input is "0" and drive circuit A input is "1" when open.) • When the above is input into the drive circuit, the output sequence from the drive circuit to the motor is D to motor to C, which starts the motor. This causes both movable contacts (A and B) to turn clockwise at the same time. When contact A separates from the FACE contact, the motor stops and FACE mode is set.

[3] Servo motor for air mix damper

When the temperature control lever in the heater control panel is operated, the resistance change in the servo motor is treated as a voltage by the built-in potentiometer and output to the air conditioner amplifier. The amplifier will operate the servo motor according to this signal and open or close the air mix damper via linkage.



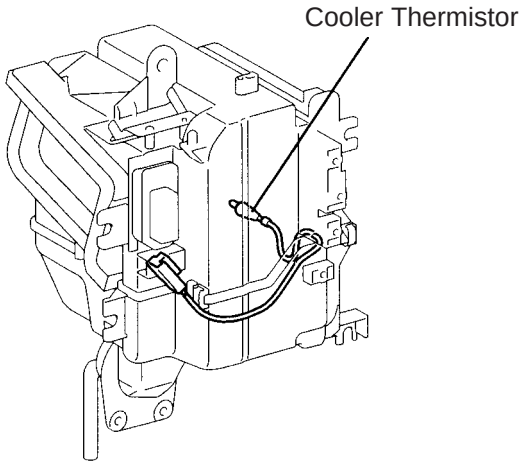


a. Potentiometer

Computes the actual air mix damper position and outputs the servo motor internal resistance change as a voltage change to the air conditioner amplifier.

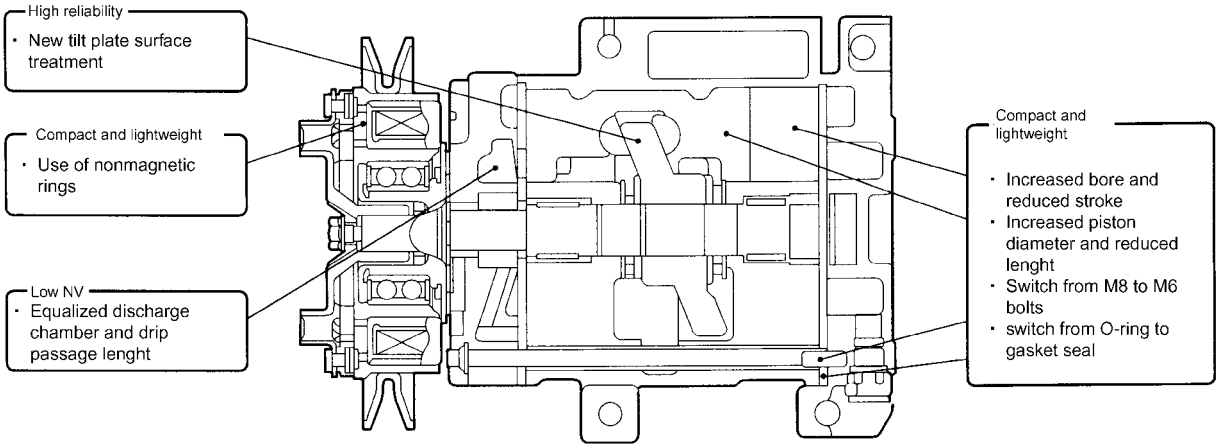
5. Cooler Thermistor

- Detects the temperature of the cold air leaving the evaporator as a resistance change and outputs it to the air conditioner amplifier.
- Installed thermistor from the evaporator inside the cooler.



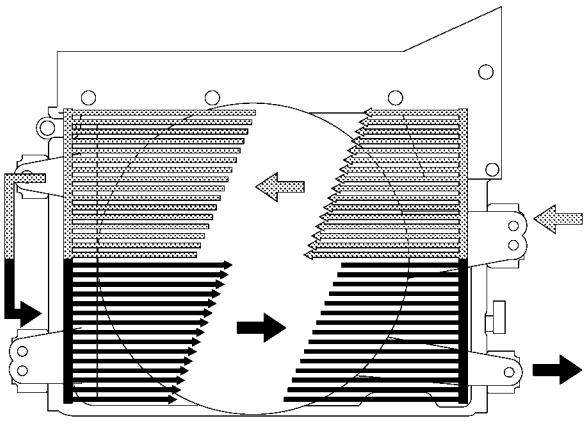
6. Compressor

- A 10S15 type compressor, which is compact and lightweight, was adopted for reliability and quiet operation.

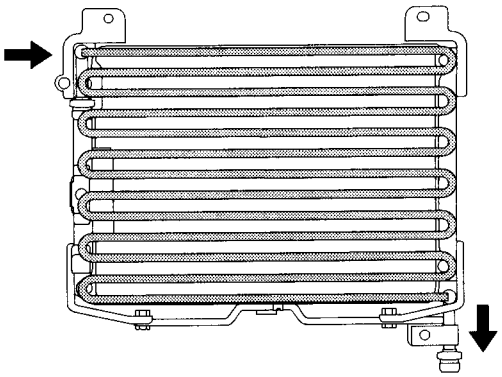


7. Condenser

- A multi-flow capacitor with excellent heat exchange performance was adopted.



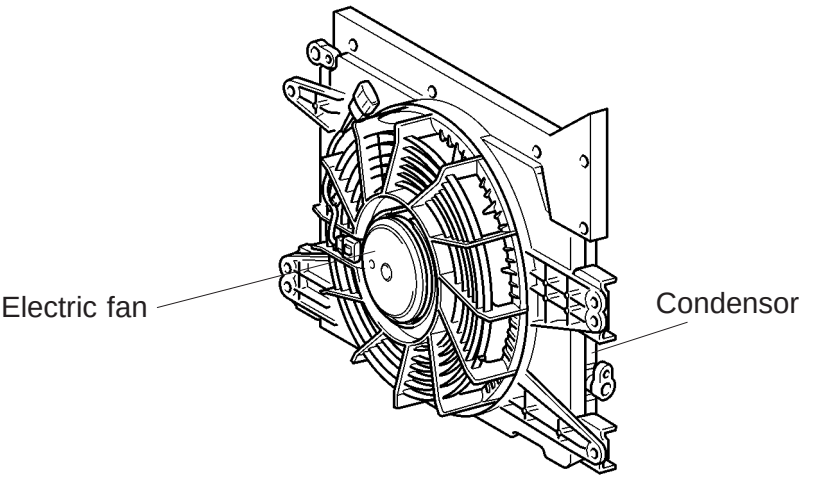
New type (multi-flow type)



Conventional type (single-flow type)

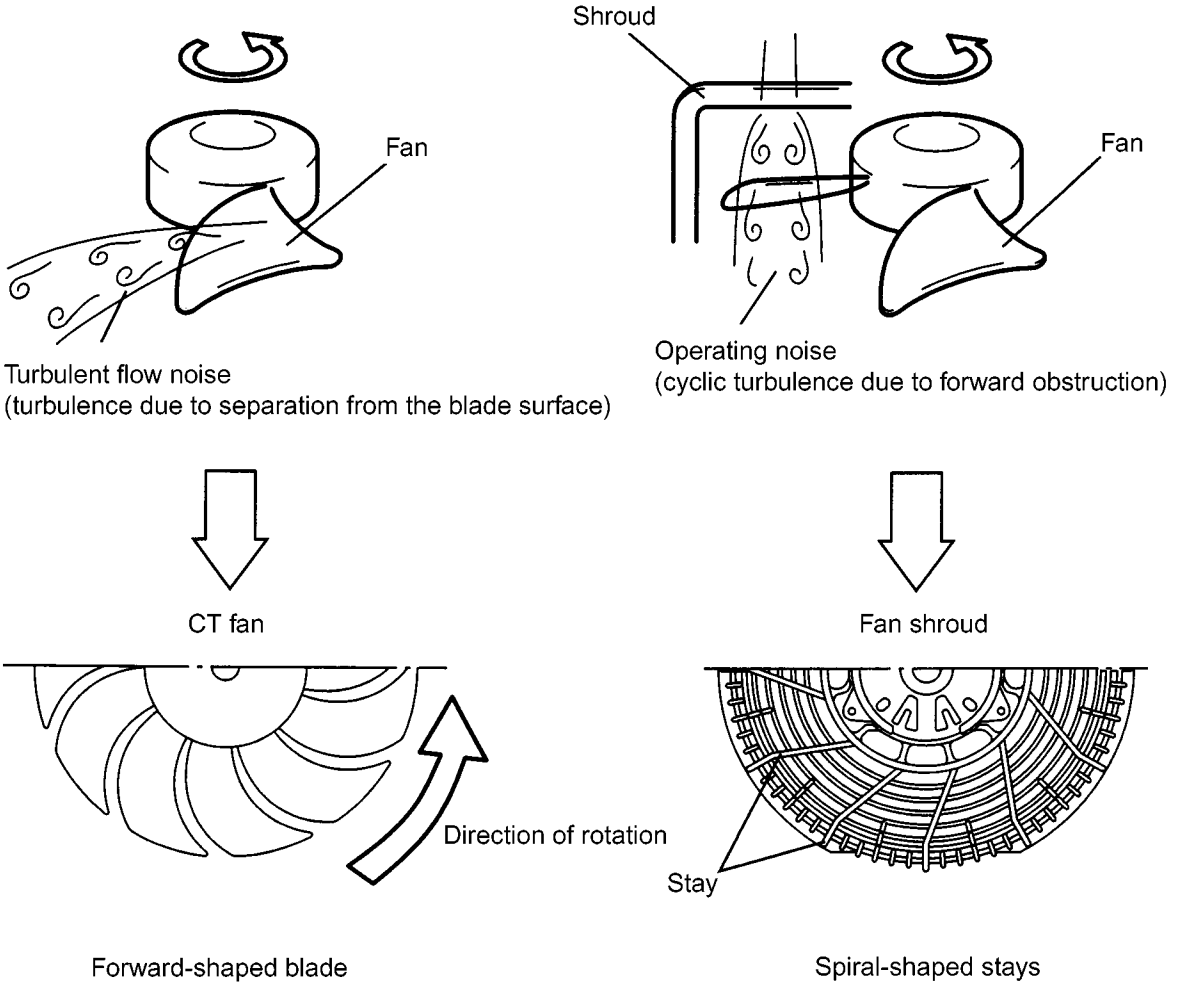
8. Electric Fan

- High efficiency and low-noise operation were obtained through use of a CT (clear tone) fan and spiral shroud stays.



1) CT fan and fan shroud

As shown in the figure, the use of forward-shaped blades and spiral shroud stays alleviates turbulent flow noise and cyclic operating noise produced by the rotating blades.

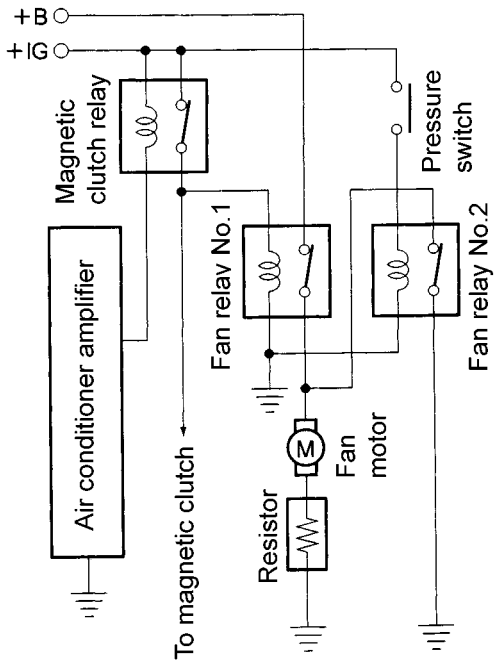


New Electric Fan

2) Two-Stage Fan Control

A pressure switch (for medium pressure cut-off) is used to detect the refrigerant pressure and control the fan speed.

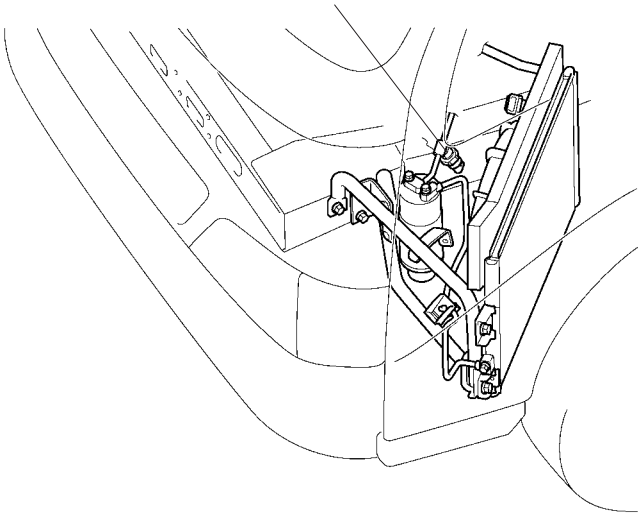
Fan speed control	Conditions	
	Refrigerant pressure	Compressor
OFF	—	OFF
Low speed	Less than 1.23 Mpa	ON
High speed	More than 1.23 Mpa	

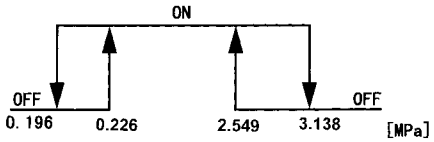


9. Pressure Switch

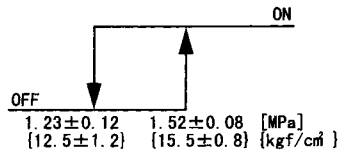
- A triple-pressure switch was adopted by integrating the pressure switches for compressor control (for high pressure cut-off and low pressure cut-off) and the pressure switch for condenser fan control (for medium pressure cut-off), and the switch was installed on the high-pressure pipe.

Pressure switch





For compressor control



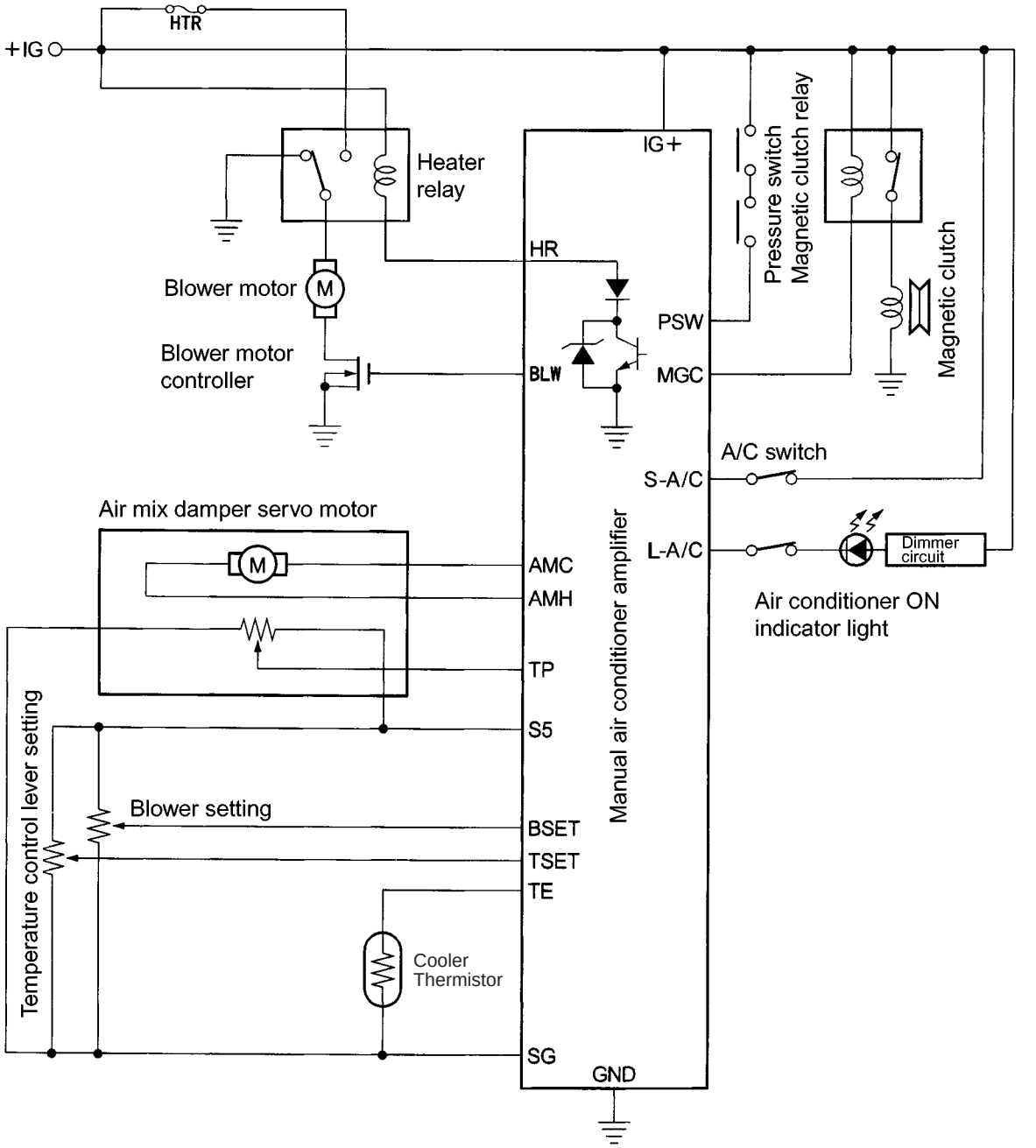
For condenser fan control

Characteristics

10. Air Conditioner Amplifier

- Executes temperature, engine speed, and other controls according to signals from the various sensor and switch operations.
- Installed on top of the heater.

[1] Circuit Diagram



[2] Operation

Air Conditioner Control

Control	Contents
Temperature control	Turns compressor magnetic clutch on and off according to temperature detected by thermistor. • Clutch is turned on when temperature rises 4°C above detected temperature and turned off when temperature drops 3°C below detected temperature.
Refrigerant pressure control	Refrigerant pressure control Turns compressor magnetic clutch off when abnormal refrigerant • Clutch is turned off when refrigerant pressure drops below 0.196 MPa (2.0 kgf/cm^2) or rises above 3.14 MPa (32 kgf/cm^2).
Air mix damper servo motor control	Determines target damper opening according to input from temperature control lever in heater control panel, and controls servo motor so that target damper opening agrees with actual damper opening.